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# JDO IS GOOD TO GO

## Java Data Objects spec promises to define methods for persistence

BY EDWARD J. CORREIA

Accessing relational databases from within Java programs is about to get easier, thanks to the release of the Java Data Objects 1.0 specification, which defines a method of storing Java objects in transactional databases and of retrieving relational data as objects. The specification, formerly known as JSR-12, was expected to be approved by the Java Community Process executive committee late last month.

According to Sun Microsystems Inc.'s Craig Russell, who served as the specification lead, the idea behind JDO was to give developers an easy way to gain persistence for their objects. "If you're a developer, you want to make your Java objects endure past the termination of your program so you can bring up another program some other place and get those same objects back."

Russell explained the need for persistence. "All the interesting applications in the world have persistent data. One program that doesn't use or store any data is a calculator. But the interesting calculators store their results, and they call them spreadsheets, which can be shared among users."

So why not simply store objects on the user's hard drive

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# Solaris 9 Due; Is Intel x86 In Its Future?

## Release for SPARC features smaller packages, enhanced security

BY ALAN ZEICHICK

After releasing a near-final second beta in January, Sun Microsystems Inc. expects to ship its Solaris 9 operating system by June. One big question, though, remains: When, if at all, will it run on Intel's *x*86 architecture?

According to Bill Moffitt, Sun's product line manager for Solaris (www.sun.com/solaris), "The Intel question has been widely misreported and misrepresented. What we announced [in early February] was that we are delaying the productization of Solaris 9 on Intel. We did not announce, by any means, that we are not going to release Solaris 9 on Intel, or that we are stopping our efforts."

When asked if Sun would definitely release Solaris 9 on Intel, Moffitt hedged his comments. "No, I can't even say that at this point, but it remains our intention to have one. I can't say for sure that there will be one, but it remains our 'plan of record,' though we're not saying when." Moffitt acknowledged that a version on Intel could be readied sometime in 2002, if Sun moved forward with it.

"We have continued to deliver Solaris 8 on Intel with its updates," Moffitt continued. "What it really comes down to is a crush for resources. We had to make hard choices. We decided to postpone releasing Solaris 9 on Intel because it isn't absolutely critical to our business. That's where we stand today. When we will make another announcement about it, I don't know."

According to Mark Thacker, technical marketing manager for security and directory services, a big change to Solaris 9 is that

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# Indecision Delays Linux Standards

## Members grow frustrated as ELC deliberates procedures

BY EDWARD J. CORREIA

SAN FRANCISCO — The Embedded Linux Consortium says it might be Christmas before it releases its first set of specifications on how to build devices based on a standardized version of embedded Linux—a timetable that did not sit well with some members of the fledgling organization at a meeting held at the Embedded Systems Conference here.

When the ELC in April 2001 changed its charter from marketing and promotions to setting standards, chairman Inder Singh said the hope was to have standards in place within a year. Now, one year later, the board has not released any specifications for core operating-system services. At one point, the meeting floor was opened to discussion of possible areas of noncore standardization, with suggestions coming in for peripheral interfaces, Java, wireless Ethernet, firmware, middleware, Web services and software development tools.

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## POTENTIAL ELC WORKING GROUPS

At the ELC meeting at last month's Embedded Systems Conference, members were invited to discuss proposals for working groups to develop noncore embedded Linux services. Here's a list of the working groups discussed and the companies that recommended them. ELC members may submit proposals to wgregistrar@embedded-linux.org by May 31.

- **Safety testing and certification**, Object Technology Inc.
- **Firmware for boot services**, Ampro Computers Inc.
- **Footprint**, Arcturus Networks Inc.
- **Middleware for residential gateways**, Arcturus Networks Inc.
- **Web services**, Wipro Ltd.
- **Open software development tools**, Software Orchestration Inc.
- **Handset specs**, Motorola Inc.
- **Mapping between ELC platform and Linux Standard Base**, Free Standards Group
- **Java**, Sun Microsystems Inc.
- **Peripheral interfaces**, Samsung Electronics Co. Ltd.
- **Native real-time**, Concurrent Computer Corp.
- **Wireless Ethernet**, emLinux

*Source: Embedded Linux Consortium*

# COMPUWARE SUES IBM FOR PIRACY

BY DAVID RUBINSTEIN

Claiming its software was pirated and that IBM Corp. is engaging in anti-competitive practices, Compuware Corp. last month filed suit against the software giant in U.S. District Court.

Specifically, Compuware is asking the court to stop IBM from selling its File Manager and Fault Analyzer mainframe tools, which Compuware claims uses misappropriated source code; to have access to prerelease technical information from IBM restored; and to have the practices of illegally tying products and steering customers ceased.

Compuware also has made a claim for damages, the amount

▸ continued on page 15

Hewlett-Packard

WebGain

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Hewlett-Packard and WebGain have teamed up to simplify the creation and deployment of mission critical, e-business applications to HP Application Server 8.0 (HP-AS). The integration of WebGain VisualCafé and TopLink provides optimized performance on HP-AS and delivers an open, standards-based architecture streamlining application deployment. TopLink, the industry leading Java to data source integration solution, can help your company dramatically reduce development time and cut costs on application maintenance.

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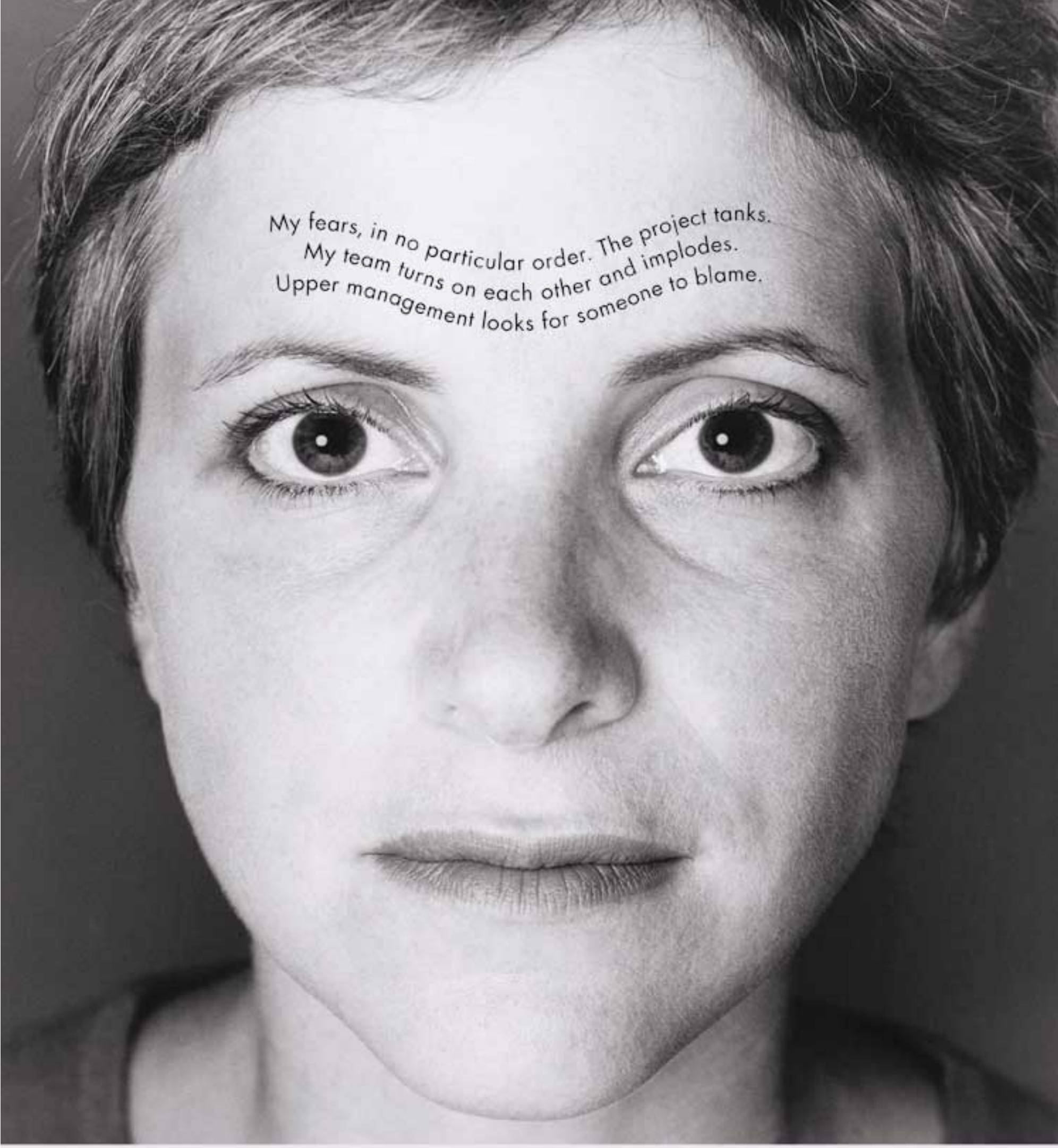
My fears, in no particular order. The project tanks.
My team turns on each other and implodes.
Upper management looks for someone to blame.

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ROGUE WAVE SOFTWARE

# JCP Updates Rules Governing Intellectual Property

**BY ALAN ZEICHICK**

Sun Microsystems Inc. last week at JavaOne revealed changes to the Java Community Process and its accompanying Java Specification Participation Agreement that are geared toward altering the way patented intellectual property is handled by members of the organization.

The JSPA is the bilateral contract that companies and individuals must sign with Sun in order to be allowed to participate in the development of new Java specifications and reference implementations. The new contract is spelled out in Java Service Request 99 (JSR-99), which was initiated in January 2001, and which passed its Community Draft Ballot phase last month.

Onno Kluyt, director of the JCP Program Management Office, said, "The JSP rules don't allow me to go into too much detail, but JSR-99 enhances the patent policy, refining the rules of what your obligations are if you hold patents in an area that a [JCP] specification tries to implement."

What "we're trying to achieve [is] that a patent holder cannot hold the community hostage," Kluyt explained. "There is a timeline in which you must make it known that you hold a patent in that area, and that you wish to enforce it. You can't, at the moment a JSR goes final, say 'Now I want some money for a license.' The timeframe is public review. By then you have to make it known that you are holding a patent and you wish to enforce it."

The rules also require that if a patented technology is going into a JSR, the patent holder must license it to any interested parties—whether or not they are members of the JCP. "It must be nondiscriminatory. If you license it, you must license it to all interested implementers," he said.

"The JCP does allow that if a company holds patents that it doesn't want to license, the portion of the specification that those patents apply to cannot be a required part of the specification," Kluyt added. "The spec must be amended or a different solution will need to be found to take away that portion of the specification."

These changes to the JCP and JSPA were the result of a compromise, Kluyt added, among different interests of the Java Community Process executive committees, but he declined to go into specifics. "It's a compromise agreement, a community agreement. Perhaps not everybody, including Sun, gets all their wishes fulfilled, but it's a middle ground that everyone can operate in."

Current JSRs that are in progress would not be affected by the new JSPA. "If you look at it legally, then [the JSPA] is a bilateral agreement between the JCP member and Sun Microsystems," said Kluyt. "As the new agreement changes the rules as far as how intellectual property is managed, the new JSPA will only apply to new JSRs that start after the new JSPA goes into effect." He said that the JSPA can be applied to in-progress JSRs only if all of its participants agree to use the new agreement.

There is a second change to the JSPA, according to Kluyt, that makes it easier for developers to create independent implementations of Java specifications by making it possible for them to obtain a new specification's test suite without being forced to take the corresponding reference implementation.

"This makes it easier for organizations like Apache to benefit from the JCP, so they can just get the specification and the test suite, but they can use their own community model to develop their implementation," he said. "Many companies have difficulty with taking in source code from somebody else, and this would circumvent that as well."

Kluyt said that the new JCP 2.5 (described in JSR-171) contained those revisions to the process needed to support the revised JSPA. Both are expected to go into effect by July.

He said that beginning in January 2002, the JCP executive committee members began to consider the parameters for another revision, to be called JCP 3.0, which might be finished by the end of the year.

Although the changes in that version haven't been set, Kluyt said a major area is to resolve jurisdictional issues for JSRs that would fit into both the Java Community Process' J2SE/J2EE executive committee and the separate J2ME committee—which he said is becoming a significant problem. "How do you define such JSRs? You want to be predictable to your members." ■

# Ascential Extracts, Transforms Acquisitions Into Platform

**BY DAVID RUBINSTEIN**

When a travel company's Web service can't communicate with a hotel reservation system because the travel service uses postal abbreviations for states and the hotel reservation system does not, some forward-looking developers would try to solve this problem by having the two sides agree on an XML schema and adapt their systems to the schema.

Ascential Software Inc., which as the surviving part of Informix Inc. has its roots in data integration, sees this as an extraction and transformation problem, and is revamping its DataStage integration platform for use in a Web services world—a world that the company sees as needing speed, scalability and trust. Parts of the platform will be added from acquisitions Ascential made using some of the $1 billion in cash the company received from IBM Corp. for the sale of its Informix database products.

**DataStage is being re-engineered to use data extraction with Web services.**

"We're not talking about using Web services to populate the data warehouse, but using extract/transform to make Web services work better and faster," said Maureen Fleming, Ascential's director of product marketing. "For simple tasks, agreeing on a schema is fine. But when levels of complexity arise, it makes more sense to use the same things companies have used to solve data incompatibility problems."

Fleming said that initiatives such as RosettaNet and ebXML, which are designed to facilitate the transfer of information, are "burdened by prearranged schema deals that make it difficult and complex to implement and change."

Add on top of that a user's belief that he should be able to get whatever information he wants almost instantaneously, and this integration issue threatens to undermine Web services. "A lot of the slowness is that data won't talk," she said. "Then companies say, 'Let's negotiate and do change management.' "

DataStage, Fleming said, is being re-engineered, with beta releases expected throughout the summer. One of the key features being worked on is to allow the data extraction and transformation engine to reside in a "wait" state, rather than "turn on and shut down." When companies were moving huge amounts of data, it made sense to turn off after each transaction, but in a framework in which many smaller information queries need to be processed, it is important for the engine to be always on to reduce the time required to return an answer, she explained. Fleming said Ascential's goal in engineering is to be able to return an answer from a request using a Web service with application-level functionality in eight seconds or less. Currently, they can achieve 10-second response time in controlled test environments.

A second new feature being built into DataStage is what Fleming called informational portlets, which can be invoked as Web services and provide information that in the past would require an integration between an application and the data store, she claimed.

Other new functionality will come from the November 2001 acquisition of Torrent Systems Inc. for $46 million and last month's pickup of Vality Technology Inc. for $92 million. Torrent's technology included Parallel Extender, which does multithreaded loading and provides the scalability piece that allows "tons of data we need to make use of informationally to move faster than ever before," Fleming claimed.

Vality was attractive to Ascential (www.ascentialsoftware.com) for its Integrity data quality assurance solution. Not only do you have to move tremendous amounts of data very rapidly, Fleming said, but the data must be trusted. A metadata console allows users to trace back through the data to ensure changes were authorized and accurate.

Plug-ins are used to attach DataStage to different systems, such as ERP, CRM and other back-end systems, and the platform also supports Web services interfaces. "It'll be interesting to see how good these interfaces are," Fleming said. "People must consider service-level commitments for their interfaces. As you support the notion of speed and view Web services as a framework, companies that can't optimize for speed will face problems." ■

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# Microsoft Targets Visual C++ Compliance

**BY ALAN ZEICHICK**

For the past two years, Microsoft Corp. has claimed that it's a changed company that wants to play by industry-standard rules. While lawsuits still rage about the business aspects of Microsoft's behavior, the company continues to make progress toward compliance with recognized technology standards.

Most recently, in late March Microsoft said that it would be bringing its Visual C++ compiler closer to compliance with the C++ 98 standard, also known as the ISO/IEC 14882 standard (http://std.dkuug.dk/jtc1/sc22/wg21). It also announced that it has hired Herb Sutter, a well-regarded independent consultant who had served as secretary of the standard body's C++ committee, to act as a liaison between Microsoft and the C++ developer community and to oversee standards compliance for future versions of Visual C++.

According to Sutter, to whom SD Times spoke in mid-March, before he officially started work at Microsoft, Visual C++ 6.0 was not particularly compliant with the C++ specs; Visual C++ 7, which shipped in February 2002 as part of the Visual Studio .NET suite, was better but still had room for improvement. The company is completing the next version of Visual C++, which he estimated will be about 95 percent compliant with the specs. "Microsoft is doing some catch-up right now," he said, "because the emphasis on conformance is fairly recent. But it's real."

**Microsoft's emphasis on conformance is recent but real, says Sutter.**

With Visual C++ 7, said Sutter, there is some improvement, mainly in compatibility with popular third-party libraries such as Boost, Lambda and Loki. With the next release, he said, "as I look at the internal builds we're doing, we are as conformant as anyone else; almost as conformant as any shipping compiler today, looking at raw scores in industry standard test suites."

Another area in which Visual C++ 7 doesn't comply with C++ 98, but which Sutter said would be fixed in the as-yet-unnamed subsequent release, is partial template specialization. "When you write generic code," he explained, "this is a feature that makes it easier to write and tune the code for special cases. Generic code was working fine in Visual C++, but the ability to specialize it in certain ways wasn't there. That's in the product now and working in internal builds."

Even so, Sutter said, the next release won't be completely compliant—but, as he said several times during the interview, "nobody today is 100 percent conformant." Some of the things it's missing are exports and full support for exception specifications. "Both of those I've written about, long before I've come [to Microsoft], and in my unbiased opinion, those are not very useful features. Frankly, I think we made a mistake putting them into the standard."

Sutter's own Web site, which includes reference material on C++, is at www.gotw.ca. ▮

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# Ipedo Adds Framework for XML Database

**BY DAVID RUBINSTEIN**

On the heels of the release of version 3.0 of its XML database server, Ipedo Inc. was expected last week to release a new framework called X/Web for building Web applications that can leverage XML—a possible harbinger of a new direction for the company, according to a senior executive.

The company early last month added four new features to its database: an XML Query Engine, the ability to deal with evolving XML schema, versioning capability and a Web services engine, according to Chas Cooper, senior product manager at Ipedo (www.ipedo.com).

"We see the XML space as sort of the TCP/IP of data," Cooper said. "TCP/IP gave disparate networks a standard for connectivity; similarly, XML plays the exact same role with managing information." Cooper said Ipedo's goal is to provide a software platform for managing XML and to make it simple to use.

Ipedo's XML database supports the most recent World Wide Web Consortium specification for XML Query, and the next release of the product will support the final recommendation when it is approved, Cooper said. "XML Query is more familiar to developers already familiar with SQL, yet it's a very powerful language that includes capabilities SQL never had in the relational world," such as allowing developers to control how query results are structured, and to use loops, declare variables and create and call functions for modular query programming, he said.

Being able to deal with data based on multiple schema standards is critical to businesses, Cooper said, and Ipedo's database solution also comes with a built-in transformation engine that uses XSL to transform data to support new schemas entirely. The Web services engine allows companies to expose the Ipedo database as a Web service by making the APIs available, allowing for communication with the database without manual integration, he explained.

One of the differentiators between Ipedo's database and those of competing companies is that Ipedo claims it supports a document-oriented paradigm instead of being simply data-centric, Cooper said. Other XML databases take XML documents and shred them into a hierarchical data model, meaning that people seeking to retrieve an XML document must query the database to recreate it, "and it never comes out exactly as it was when you put it in," Cooper said. The database starts at $29,000 per server processor, he said.

The X/Web framework, due out at the end of last month and included for free with the database, includes a JavaServer Pages tag library that enables developers to query the Ipedo database directly from those pages, Cooper explained. JSP tags also allow developers to transform XML content and render it into different delivery formats such as PDF or HTML. He said the company expects to deliver similar frameworks for other technologies throughout the year, such as Active Server Pages. ■

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# News Briefs

## COMPANIES

**IxiaSoft** and **Altova Inc.** have jointly released the XML Spy Integration Kit. The free package lets Altova's XML Spy 4.0 users work directly with IxiaSoft's TextML XML database server . . . **Altova** also has released XML Spy 4.3 IDE with support for **Microsoft Corp.**'s SQL Server 2000 SQLXML tools that create XML views of relational data. New SQLXML developer tools are included with XML Spy 4.3 Suite, available at www.xmlspy.com/download.html . . . Performance analysis solutions provider **Ixia** has acquired **Empirix Inc.**'s ANVL (Automated Network Validation Library) protocol suite; terms were not disclosed. Ixia has released an enhanced version of the ANVL Internet Protocol test compliance software to accommodate IPv6. The suite conforms to IETC RFCs 2460, 2464 and 2472 . . . Media company **101 Communications LLC**, which had ceased publication of the Journal of Object Oriented Programming and Java Report in late 2001, announced that it would not be combining those two products into a new stand-alone magazine called Programmer's Report, as previously planned. Instead, Programmer's Report will be an occasional supplement to Application Development Trends.

## PRODUCTS

Merant International Ltd. has updated its **PVCS Professional** software configuration system to be compatible with the WebDAV standard and to include new workflow features. PVCS Pro 3.8 lets developers create documentation using Microsoft's Office Suite products, and Macromedia's Dreamweaver . . . Jungo Software Technologies Inc. has updated its Windows 2000/XP **WinDriver**, **KernelDriver** and **Hardware Debugger** device driver toolkits to support the USB 2.0 specification. The 5.04 toolkits are now also available for hot-swap CompactPCI . . . RedSonic Inc. has released a version of its **Red-Builder 2.0 XE** embedded Linux tool without a hardware protection key, also known as a dongle. Red-Builder lets developers create custom board support packages . . . Version 2.8 of AltoWeb Inc.'s **AltoWeb Application Platform** now works with AIX and Red Hat Linux. Application Platform, which combines a J2EE app server with a rapid-application development framework, now also has the ability to use WebMethods' enterprise adapters. The platform costs $3,500 per developer seat, with a deployment cost of $15,000 per server processor . . . MKS Inc. is offering a free plug-in that integrates its **Source Integrity Enterprise Edition** with IBM Corp.'s **WebSphere Studio Application Developer**. SIEE is a cross-platform software configuration management tool . . . Microsoft Corp. now is offering a special **Visual Studio .NET Academic** suite for higher education. The version includes tools to help manage classroom assignments and extract code from projects, plus new documentation for faculty and new extra code samples. Microsoft also is offering an educational version of its MSDN program for $799 per academic department at www.msdnaa.net . . . Noetix Corp. released **NoetixView 4.2 for Oracle Applications**, a business-information viewer for Oracle's ERP suite. The latest version includes a module for OA's human resources application as well as 50 new data views . . . ComponentOne LLC is bundling its **ComponentOne Studio for .NET** along with copies of Microsoft's **Visual Studio .NET** for $1,599.95. The company's component suite includes spreadsheet and database grids, database reporting tools, a print previewer, a file compression utility and a spell checker . . . Transvirtual Technologies Inc. has released a new version of **XOE**, its Java-based Web services application framework. The latest version runs on Windows XP and within any J2SE virtual machine; previously XOE ran only on Linux . . . Cyan Technology Ltd., a U.K-based embedded tools developer, has released an **evaluation board and tool set for its eCOG1 communications microcontroller**. The tools, which run on Windows, support mixed C/assembler programming and source-level debugging. The company also is opening its first U.S. office in the Boston area . . . Cape Clear Software Inc. has released what it modestly calls the world's first integrated Web services development environment. **CapeStudio 3.0**, which shipped mid-March, lets developers create Web services using existing Java, EJB or CORBA components using a WSDL editor and code generator. The

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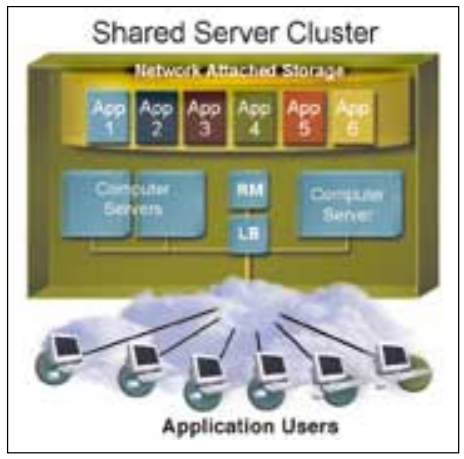
# Ejasent Shares Application Loads

## Manages parallel runs across multiple servers

BY ALAN ZEICHICK

Ejasent Inc. believes that it has found the way to make applications more scalable: Run them in parallel across many servers, adding more processor power when needed and scaling back when loads drop off. It's part of a trend that's sometimes labeled "utility computing," wherein application images are loaded into a server's memory and then parceled out as pieces of work by a hardware or software load balancer.




**Apps are restored from a shared disk in seconds and saved back to disk when demand subsides.**

Kevin Vitale, the company's CEO, said that with the Upscale Data Center management software, "We break the traditional paradigm of servers being dedicated to a single application. We can dynamically share servers across many applications. We can load and unload full application stacks, and thereby drive up the efficiency of server CPU resources. Before there were downtimes and peaks and valleys in the application usage profile; those [underused] resources can now be applied to other applications." He claimed that by eliminating these peaks and valleys, hardware server resources can typically gain 10 times more efficiency.

He also said the data manager includes a feature called MicroMeasure, which counts the actual amount of process resources used by a specific application "down to the CPU tick." This can be used to not only institute chargebacks, if necessary, but to more accurately forecast future demand for processor resources. The price for the software is approximately $5,000 per server processor, according to Vitale.

Rajeev Bharadhwaj, the founder and CTO of Ejasent (www.ejasent.com), explained that the solution requires racks of servers connected to network attached storage. A dedicated server running the Upscale software manages the server farm by loading and unloading application images to each of the servers from the disk array, and then sends each server network transactions from the load balancer.

The servers are booted off of a local disk, load a special software agent, and then can receive the application images from the Upscale server. According to Bharadhwaj, any application can be run on the environment, assuming that it's compatible with the server's operating system. "These are like Oracle instances, or BEA on top of Oracle, or Broadvision. On average, it takes one to two seconds to load the application, but really large applications might take 10 seconds."

"It's almost like paging [on a single larger server]," said Bharadhwaj. "One key difference between paging and what we do is that you can move [the application] from one machine to another. The machines don't have be identical or have the same number of processors or have the same amount of memory, but they typically have to have the same operating-system version. It's more like a core image. When you take a core dump, you end up with the whole image of the process. Imagine if you could run that image somewhere else."

Although Bharadhwaj said that any application can run on the system, he noted that if developers know that they're targeting an Upscale environment, they can tune their apps to leverage it. ■

# DATADIRECT'S CONNECT JDBC GETS SDK

BY CHRISTINA M. PURPI

DataDirect Technologies Inc. was scheduled to release an updated suite of JDBC drivers and database tools at last week's JavaOne conference. According to the company, Connect JDBC 3.0 includes a new XML data transformation tool called jXTransformer, as well as testing and diagnostic tools.

Connect JDBC, said Evan McDonnell, vice president of product marketing at DataDirect (www.datadirect-technologies.com), delivers software connectivity components used by ISVs and corporate developers to connect data and applications. He claimed DataDirect is the only vendor whose product includes a full suite of drivers that perform consistently across all major databases, including Oracle, Sybase and IBM's DB2 and Informix.

"There is no standard way to implement and use XML across different databases," claimed McDonnell. "Database vendors, who you would think would focus on interoperability, have [each] implemented XML differently." In order to solve this problem, the new jXTransformer tool automatically takes data from within Java programs and transforms it to XML for use across multiple databases.

In addition to jXTransformer, Connect JDBC 3.0 includes a proprietary SDK for the JDBC driver, as well as a JDBC debugging tool.

According to Brian Reed, vice president of business development and strategic planning, another new tool, called JDBC Spy, lets developers trace JDBC calls, which facilitates debugging as well as performance optimization in an application.

While McDonnell acknowledged there are many free drivers available to developers, she said these "are generally thought of as an afterthought and are usually out of sync by at least a version from the underlying database."

Also according to Reed, the JDBC drivers are now compliant with the latest JDBC specs required by J2EE 1.3 and J2SE 1.4. The suite is priced at $2,500 per server and database. ■

In software development, testing should occur:

A. At the beginning

B. In the middle

C. On people who think testing should occur only at the end

be liberated

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# HyWy Updates Java Productivity Environment

## Renamed PE.J generates code, object persistence, complies with JDO spec

**BY ALAN ZEICHICK**

Less than a year after unveiling POPE.J—its Productivity Environment for Java—HyWy Corp. has a new version of its Java developer utility that sports a new name, more code-generation options, an improved user interface, and compliance with the new Java Data Objects specification.

According to Preet Khalsa, CTO of HyWy (www.hywy.com), the new version is simply called PE.J, for Productivity Environment. "A very good rule of marketing is name your product what it does," he said, adding that the old name led to confusion with prospective customers.

**PE.J's new user interface was modeled after an old-fashioned radio.**

The tool sits on the developer desktop and integrates with all the major UML modeling tools, databases, app servers and Java IDEs, Khalsa claimed, and is used to generate what he described as mundane code. "We will generate those things that are error-prone because they are so remarkably rote in nature. That assists the programmer and improves their productivity.

"Yes, we generate the code for you," he continued, "but a lot of people do that. We will also generate all your persistence, in the sense of connecting your Java objects to relational databases. We are also one of the first vendors to come out supporting the JDO standard. We also generate JSP applications, test scripts, anything that can help a developer over the life of the application, and also help the development manager. For example, when you are working from one phase of an application to another, you can now see an impact analysis of the differences from one version of the code to the other."

Khalsa said that PE.J's new user interface was modeled after an old-fashioned radio. "A user interface should be appealing as well as functional. You've got a knob on the left, a knob on the right and some throw switches in the middle, and that's how you operate it."

The tool comes in two versions. The first, scheduled to ship late last month, is called PE.J Developer Edition, and is priced at $4,000 per developer seat. The second release, expected later in 2002, will be called System Engineering Edition, and will consist of an add-in to the Developer Edition that expands its functionality beyond the individual programmer, said Khalsa, who added that the company hasn't determined a pricing model for this version. ▮

# CodeWright Calls Meetings to Order

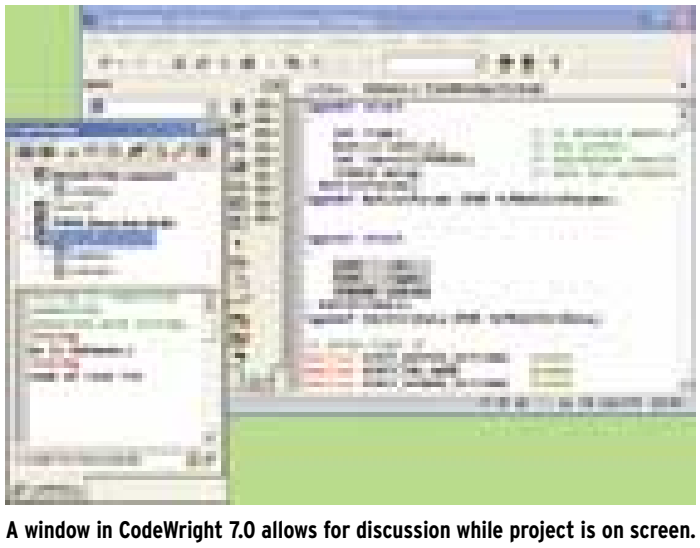
## Collaborative features enhanced in latest Starbase release

**BY DAVID RUBINSTEIN**

With the version 7.0 release of its CodeWright source-code editor, Starbase Corp. builds on its support for collaborative development to create what it claims is a more fully featured editing system.

The major new addition to CodeWright, according to senior product manager Jim Stevens (www.starbase.com), is CodeMeeting, a peer-to-peer system that lets developers share files and discuss them online, with the code on-screen, in real time. "Developers can see changes live as they're made," Stevens said. "You don't have to get everyone in a room to have a code walkthrough." A chat window within the project viewer allows for discussion while changes to the project appear in the larger window, Stevens said.

Among other new capabilities is binary differencing, which allows for side-by-side views of binary files. "This is especially important to embedded systems programmers, who can see quickly which lines were changed," Stevens said. A new call tree allows developers to get a reference view of every file and line location to understand where and how functions are used, Stevens said, while a new XML editor, called XML Transformation Viewer, adds support for Extensible Stylesheet Language and enhances editing functionality in the viewer.



**A window in CodeWright 7.0 allows for discussion while project is on screen.**

Other enhancements include color-limited searching capability, which narrows searches throughout projects or file directories to the color of a user; detachable tabs in the project view; and a feature that facilitates reuse by allowing developers to construct code from selected pieces of already existing modules, Stevens said.

Stevens also pointed out that CodeWright has a tight synchronization to Visual Studio .NET, which allows developers writing in C, C# and Visual Basic within that IDE to bring a Solution file into the CodeWright editor and keep both the project view and document window synchronized as changes are made.

**CodeMeeting adds peer-to-peer communication, says Starbase's Stevens.**

"We were known for being an editor," said Stevens of CodeWright, which retains the $299-per-developer price he said has been in place for more than two years. "We're stepping beyond that now. It's our foundation feature, but now it's become more of a system. With peer-to-peer, and no expensive server involved, the editing functionality takes it beyond being merely a chat forum." ▮

# EMPIRIX REVAMPS WEB SERVICES TEST TOOL

**BY ALAN ZEICHICK**

Test-tools maker Empirix Inc. has updated its FirstAct Web-services performance and functional-testing tool with improved diagnostics for WSDL files, a better test-case generator, and a new user interface geared at nontechnical QA technicians.

Steve Kulak, FirstAct project manager, said the tool was originally intended for testing COM components but is now focused on testing the performance of XML-based Web services. "There's an overhead to using Web services, and preliminary analysis we've done says that this overhead gets worse as you increase the number of users on your enterprise software."

Empirix (www.empirix.com) appears to be focusing on the testing of Web services by QA technicians used to testing Web sites by interacting with their browser-based interfaces. "Testing Web services is more difficult than testing a Web site, because a Web site has, by definition, a user interface. Most Web services don't have a user interface. With Web services, the final deliverable may never have a user interface."

This led, he said, to a real problem: "Historically, if you wanted to test Web services, you had to do programming. You had to have a developer do the testing, or create or update the tests. But if QA people want to do testing, FirstAct allows them to do everything with testing. FirstAct lets them create, execute and maintain the tests. The other tools in the market still depend on programming to make the tests. There's a problem because in some organizations, developers and QA don't work together."

To that end, FirstAct 2.0 analyzes the correctness of the Web Services Description Language file, to ensure that users of the Web service can acquire the correct information from the Web service, Kulak explained. It also automatically generates tests for complicated Web services, and contains a new user interface geared at new programmers. Results of the product are aimed not only at functional correctness of the Web service, but also at measuring its respond time during different load conditions.

The tool is now available for $4,995 per test seat, and runs on Windows 2000/XP workstations. ▮

# TogetherSoft Focuses on Developers

## ControlCenter's new interface changes look from modeler to IDE

**BY DAVID RUBINSTEIN**

With the release of version 6.0 of its Together ControlCenter development environment at the JavaOne Conference last week, TogetherSoft Corp. is emphasizing the "build" portion of its model-build-deploy motto, adding features for developers and even changing the look of the product.

"We have been hearing from our customers that they want to stay in the environment," said vice president of product development Todd Olson, and not have to utilize third-party development tools. "We have reshaped the interface to look more like an IDE instead of a modeling tool, and made changes in terminology…to appeal to a larger developer base, rather than just architects and modelers."

Among the new features are a new UI builder that includes patterns and audits so developers can check their work against Java look-and-feel guidelines; a new module that organizes unit tests in the Junit, Cactus and HTTP unit frameworks; and 10 new code-refactoring functions that automate simple design changes without breaking code, such as moving attributes from one object to another and checking the impact on dependencies, Olson said.

He added that ControlCenter now includes support for the EJB 2.0 specification, as well as an XML editor, an integrated UDDI browser and support for WSDL.

Outside the "build" arena, ControlCenter 6.0 also allows developers to do real-time systems modeling, which Olson called a plus for embedded systems developers. The company also has changed its licensing to allow temporary use of the product on computers outside the office. ControlCenter 6.0 costs $5,000 per developer seat; a solo license without team-oriented functionality costs $3,500, Olson said.

Keith Boswell, vice president of product management, said ControlCenter 6.5 will be released sometime over the summer, and that the company (www.togethersoft.com) plans to begin selling its modeling and IDE products separately. "We want to provide flexibility for what people realistically do," he said. "Not everyone does modeling and needs those tools." ▮

## NEW MANAGEMENT TEAM THINKING BIG

In the March 15 issue of SD Times, it was reported that John "Beau" Vrolyk was replacing Peter Coad as chief executive at TogetherSoft Corp.–despite a 2001 growth rate 81 percent above 2000 levels.

In fact, Vrolyk replaced Coad because of that growth.

Coad, one of the leading advocates of software modeling, founded the company in 1999. Since then, it has grown to employ roughly 400 people, with revenues last year of $47 million. "It didn't make sense to have the board beating on this technical visionary over operational issues relating to sales and distribution efforts," Vrolyk explained last month during an interview at SD Times' editorial offices. "In a hypergrowth environment, experience helps, knowing which pitfalls to avoid."

One pitfall the company could not avoid was layoffs. After ramping up so quickly to meet growth, and watching as first the economy crashed and then New York City's Twin Towers collapsed, the loss of jobs was almost inevitable. "Yes, we laid people off," Vrolyk admitted. "But it was around the issues of pruning dead wood and realigning the work force."

Vrolyk, a member of the TogetherSoft board with more than 20 years of experience in software company management, is serving as temporary CEO until a replacement can be found. Initial contacts with potential candidates already have begun, however Vrolyk would not put a time frame on when he hopes to find a permanent replacement.

Whoever ultimately wins the position, he or she will find a company that is shifting its sales focus from small groups to substantial enterprises "buying thousands of seats," Vrolyk said. TogetherSoft was not ready until recently to target enterprise shops, Vrolyk said, because it only added full round-the-clock technical support within the past year and the sales and support staff are only now being trained to understand the needs of enterprise customers. The one thing the company does have, he claimed, is a product—Together Control Center—that's "battle hardened."

*–David Rubinstein*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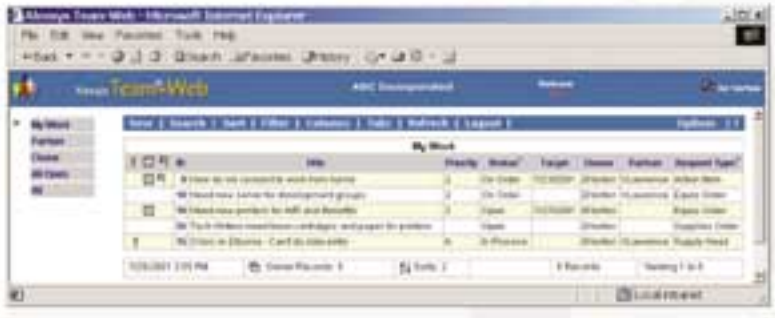

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# News Briefs

## MORE PRODUCTS

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tool costs $2,500 per developer, and includes one runtime license for CapeConnect 3.5, the company's Web services execution environment.

## PEOPLE

BUWALDA

**Hans Buwalda** is test/QA company LogiGear Corp.'s new chief architect. Previously, Buwalda served as a project manager at CMG the Netherlands . . . Test-software maker Empirix Inc. has hired **Joe Alwan** as its VP of business development. Alwan had been senior VP of worldwide marketing at Open Market and director of global partners at Sun Microsystems Inc.

## STANDARDS

The W3C has unveiled the draft of a new **royalty-free patent policy**, which requires all companies and individuals who participate in the development of W3C Recommendations to make any essential patents they hold available for free. The group also has released the first Working Draft of the requirements for the **Ontology Web Language 1.0**. OWL, a component of the group's Semantic Web initiative, discusses how to create a common set of terms that can allow for more accurate Web searches . . . The **Java Community Process** has moved **JSR-77**, for J2EE management, to Proposed Final Draft status. Sun Microsystems Inc. has introduced **JSR-172**, a Web services specification for J2ME. Sun and IBM Corp. have jointly offered **JSR-168**, a common portlet specification geared toward enabling interoperability between portlets and portals. Day Software AG is leading the new **JSR-170**, a project to define a standard API for accessing content repositories. ▮

# Management Summit Expands SD Conference

BY CHRISTINA M. PURPI

This year's Software Development Conference and Expo will add yet another event as the format changes to become three shows in one. The SD Management Summit is designed specifically for the software development manager and will focus on best practices dedicated to project success and overcoming common obstacles.

Scheduled to take place from April 22–26 at the San Jose (Calif.) Convention Center, the 15th annual conference, owned and produced by CMP Media LLC, will for the second time include Web Services World, an event dedicated to strategies and technologies of Web services, or what the company calls the future "software as a service" model.

Each of the three conferences will have its own set of classes and tutorials, in addition to 75 exhibitors and five keynote speakers who will discuss topics ranging from delivering .NET, to the sins of software estimation. Just added to the show is a Java University program, a series of training tutorials for experienced developers. ▮

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Tuesday, 8:30 a.m.–5 p.m.
Wednesday, 8:30 a.m.–6 p.m.
Thursday, 8:30 a.m.–7:45 p.m.
Friday, 8:30 a.m.–4:30 p.m.

**EXHIBIT HOURS:**
Tuesday, 5 p.m.–6:30 p.m.
Wednesday, 1 p.m.–6 p.m.
Thursday, 11 a.m.–4 p.m.

**KEYNOTES:**

**Monday**
12:30 p.m.–1:30 p.m., "Read My Lips: No New Models!" Karl Wiegers

**Tuesday**
6:30 p.m.–7:30 p.m., "10 Deadly Sins of Software Estimation," Steve McConnell

**Wednesday**
Noon–1 p.m., "Delivering .NET: Visual Studio .NET and the .NET Framework," Anders Hejlsberg

2:30 p.m.–3:30 p.m., "The Keyhole Problem and Its Many Kin," Scott Meyers

**Thursday**
1 p.m.–2 p.m., "The State Horizon: Why Web Services Must Be Loosely Coupled, and What It Means for Engineers," Clay Shirky

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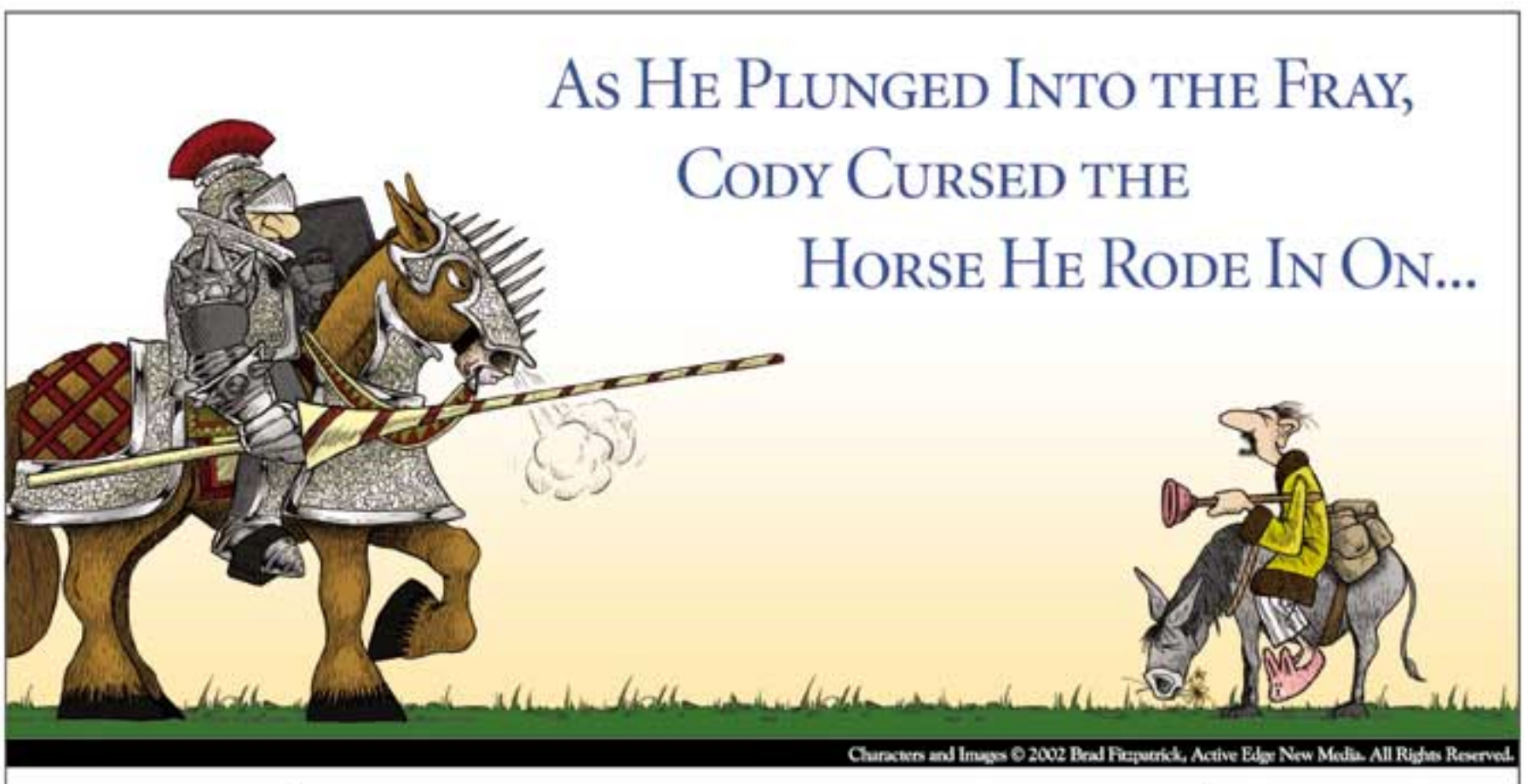
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# Foglight Shines on Performance Issues

## Quest application monitoring tool modified to work with more environments

**BY DAVID RUBINSTEIN**

Quest Software Inc. this month will release a specialized agent designed to help shine its Foglight application monitor into Oracle E-Business Suite applications. Later this spring, the company will bring out a new agent for instrumenting IBM's DB2 database running on Unix.

The Foglight management server, which is designed to live on a dedicated box and monitor every layer of the application technology stack, acts as the repository in which all metrics, best practices and other information are stored. It runs on Solaris or Windows servers, according to Chris Spacko, Quest's product marketing manager for monitoring solutions. Sitting on top of that is what Spacko called a Policy Engine that allows companies to predefine service-level agreements based on a conglomeration of data sources and servers. There is also a management console with both Java-based and browser interfaces, he said.

"We try to stress that [Foglight 3.0] allows the ability to do correlation across multiple components," Spacko said. "The product is designed and architected from the ground up to give one management point with seamless integration. You need to look at all components in the stack to find the breakdowns. If you lose [performance] in one spot, users can't connect." Aside from the Oracle and DB2 on Unix integrations, Foglight already integrates with Microsoft's SQL Server and Sybase's 12.5 databases, as well as Siebel's and PeopleSoft's CRM solutions, he added. Foglight also provides hardware performance statistics, such as memory utilization and network throughput rate.

Other new features include the ability to create maps of servers and custom reports, and a new ODBC driver to the Foglight database, according to the company (www.quest.com).

In addition, the company has redesigned the user interface, which now includes the ability to make maps of servers or applications.

In the future, Spacko said Quest will look to bring its tools into Java application server environments; the company already has an agent for BEA's WebLogic application server.

Foglight also has the ability to call into Quest's Spotlight real-time diagnostic tools to pinpoint problems by tracking the flow of a transaction, Spacko said. Quest sells the dedicated management server for $20,000, plus $1,000 per instrumented server, he said. ▮

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# COMPUWARE

◂ continued from page 1

of which president Joe Nathan said the courts would ultimately decide.

A spokeswoman for IBM, Carol Makovich, said it is that company's policy not to comment on pending litigation.

Compuware (www.compuware.com) sells software tools for S/390-series mainframes, and had been regularly updated on the new IBM products. Nathan said Compuware noticed the flow of information from IBM "ground to a halt quickly" a few years ago. Then last fall, the copying issue came up.

"Their products looked like ours, and even had the same bugs as ours before we fixed them," Nathan said. "And the product manuals documented features that are in Compuware products and not in theirs."

Nathan said he tried to contact IBM to address these issues but made no headway, so he resorted to litigation.

David Ettinger, outside counsel to Compuware, said the lawsuit seeks to stop IBM from tying its software products to its hardware, and to stop steering customers to IBM's products under the pretext of working in a customer's best interests.

"IBM Global Services is a huge organization that in effect takes over a company's IT," Ettinger claimed. "We're alleging they have undertaken the direction of picking their products over competitors' products whether or not they're best for their customers. If a company like IBM represents they'll make decisions in the best interest of their customers and then doesn't, we think that is illegal."

Ettinger said that the companies have a 20-year history of cooperation, and the result has been good for IBM, its ISVs and customers.

He claimed the abrupt cessation of technical knowledge flowing to Compuware in the context of that cooperation represents anti-competitive practices.

The case has been assigned a judge; no dates have been set yet for the filing of briefs. ▮

# OC Systems Diagnostic Tool Goes J2EE

**BY CHRISTINA M. PURPI**

OC Systems Inc. has enhanced its RootCause diagnostic software to become compliant with Sun's J2EE specifications, expanding its compatibility beyond Java 2 Standard Edition.

**The new release works with EJBs and servlets, says OC Systems' Cole.**

Calling RootCause a "software flight recorder," OC Systems (www.ocsystems.com) president Oliver Cole claimed that the beta version of RootCause Java Enterprise Edition traces the execution of deployed Java applications. The new release can work with Enterprise JavaBeans code as well as Java servlets, according to Cole, who said this edition provides a predefined set of traces for Sun's J2EE 1.2 and 1.3 APIs. The J2EE functionality works only on applications running on the BEA and iPlanet app servers. Pricing begins at $5,000, Cole said. Later this year, OC Systems plans to release RootCause for Linux, according to a company spokesperson. ▮

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# SOLARIS 9

◂ continued from page 1

more functionality has been moved out of the core of the operating system and put into smaller, more granular packages than in previous releases. Thacker cited Telnet; increasingly, he said, businesses aren't installing Telnet, preferring instead to use SSH (the secure shell). With Solaris 8 and before, the Telnet client and server were part of the core operating system and couldn't be removed; with Solaris 9, they are in separate packages, and can be completely uninstalled or simply not installed, as desired.

Thacker also said that for the first time, Solaris includes an internal pseudo-random number generator, which will be made available as a service to any application that needs it; a strong random-number generator is key to implementing cryptography. Solaris 9 also adds IKE (Internet Key Exchange) protocol to the IPSec (IP Security) support introduced with Solaris 8.

A significant feature for developers, according to Thacker, is that they can compile code in such a way that forces Solaris—or individual applications—to ignore instructions that would execute code on the stack. Accidentally running such code is a frequent cause of buffer over-runs, and can be used to hack a system. Nearly all root-aware applications in Solaris 9 have been compiled with that new option, he said, adding, "Solaris now enforces good programming policies."

Moffitt said that developers will immediately see performance improvements from a new threading library included with Solaris 9. "The API doesn't change; it's just the underlying implementation of the library that has changed. Developers will see better performance across the board with multithreaded applications, and more linear scaling with multithreaded applications. We did that by cutting out a lot of overhead and changing the threading model slightly to increase the efficiency of the algorithm. You don't have to recompile or relink. It just works." He said that although some applications Sun tested showed a threefold improvement in performance, and a few others actually ran slower, he projected that most multithreaded applications will see a 10 percent to 15 percent performance improvement.

Another change is a developer's control over memory paging. "When you have a lot of memory, you run into the efficient use of virtual memory. We're introducing support for multiple page sizes in an application, so the application can use an API to change the page size that it's using in virtual memory, and thereby gain a lot of performance improvements on big systems."

### SOLARIS AND OPEN SOURCE

Moffitt also discussed what he called integration with the open-source world.

"We're putting a lot of work into Gnome 2.0," he said, speaking about the not-yet-finished open-source graphical interface project (www.gnome.org). "We are planning to integrate Gnome into Solaris 9 in a future release," possibly later in 2002.

Moffitt also stated that Sun is working with the open-source community to make Solaris a manageable platform for deploying open-source applications. "We're doing a lot of things like integrating Apache and Perl, and secure shell into Solaris, and also bringing things in specifically from the Linux world, like a lot of Linux commands and utilities. We're also bringing in the APIs by porting the actual libraries, like GTK+ and the GIMP libraries." One example he cited is the bash shell, "so that Linux shell scripts will run properly on Solaris."

That means, according to Moffitt, "you can bring in [Linux] source code from open source, say 'make,' and expect it to compile, build and run on your Solaris machine without any problem." He expects that over time, "75 percent of the major client-side and server-side Linux applications will run on Solaris. Bring 'em in, make 'em, and let 'em go."

Finally, Moffitt said that the Solaris 9 release will include the 64-bit J2SE 1.4 virtual machine for SPARC. "That potentially opens up a whole new world for Java in being able to build and deploy very large applications, and applications that use large amounts of memory." That JVM is currently available for download for Solaris 8 from http://java.sun.com/j2se/1.4. ▮

# JDO SPEC

◂ continued from page 1

like documents? "If you're a program, you don't want to deal with a document, which [is like] a complex web of objects. If you're an object-oriented programmer, you like to deal with objects. Persistence allows you to store those documents as individual objects."

Another major benefit of JDO, Russell said, is its abstraction of database command language. "Real world data used in business isn't formatted as a document, but as a piece of interconnected data that spreads through a database," he said, and the JDO interface allows developers to view that interconnected data as Java objects.

Several companies have recently released solutions based on the JDO specs, including database component developer Poet Software (see "FastObjects With JDO: 'Write Once, Persist Anywhere,' " page 20) and SolarMetric Inc., which has unveiled its Kodo JDO Enterprise Edition 2.2 implementation.

According to Patrick Linskey, vice president of engineering at SolarMetric (www.solarmetric.com), Kodo software lets developers tie Java applications into their company's existing J2EE server and have their "JDO transactions governed by the application server," which he said simplifies installation, configuration and deployment. Kodo supports BEA's WebLogic, IBM's WebSphere and open-source JBoss application servers.

With a JDO implementation, Russell explained, Java applications can access relational data stored in rows and tables without querying the database. "It's a huge productivity boon to programmers to be able to say 'I don't care where the data is or in which database, or anything about SQL; I'm going to access it using the Java programming language.' "

Before JDO, Russell said the alternative would be for programmers to learn SQL in addition to their programming language plus to know the operating environment and how to access the JDBC driver. "They would have to be a little bit of an expert in a lot of different areas. Now with JDO, all they need is to learn the API, and they can access the domain objects in a standard and transparent way, and it doesn't matter where the data lives." ▮

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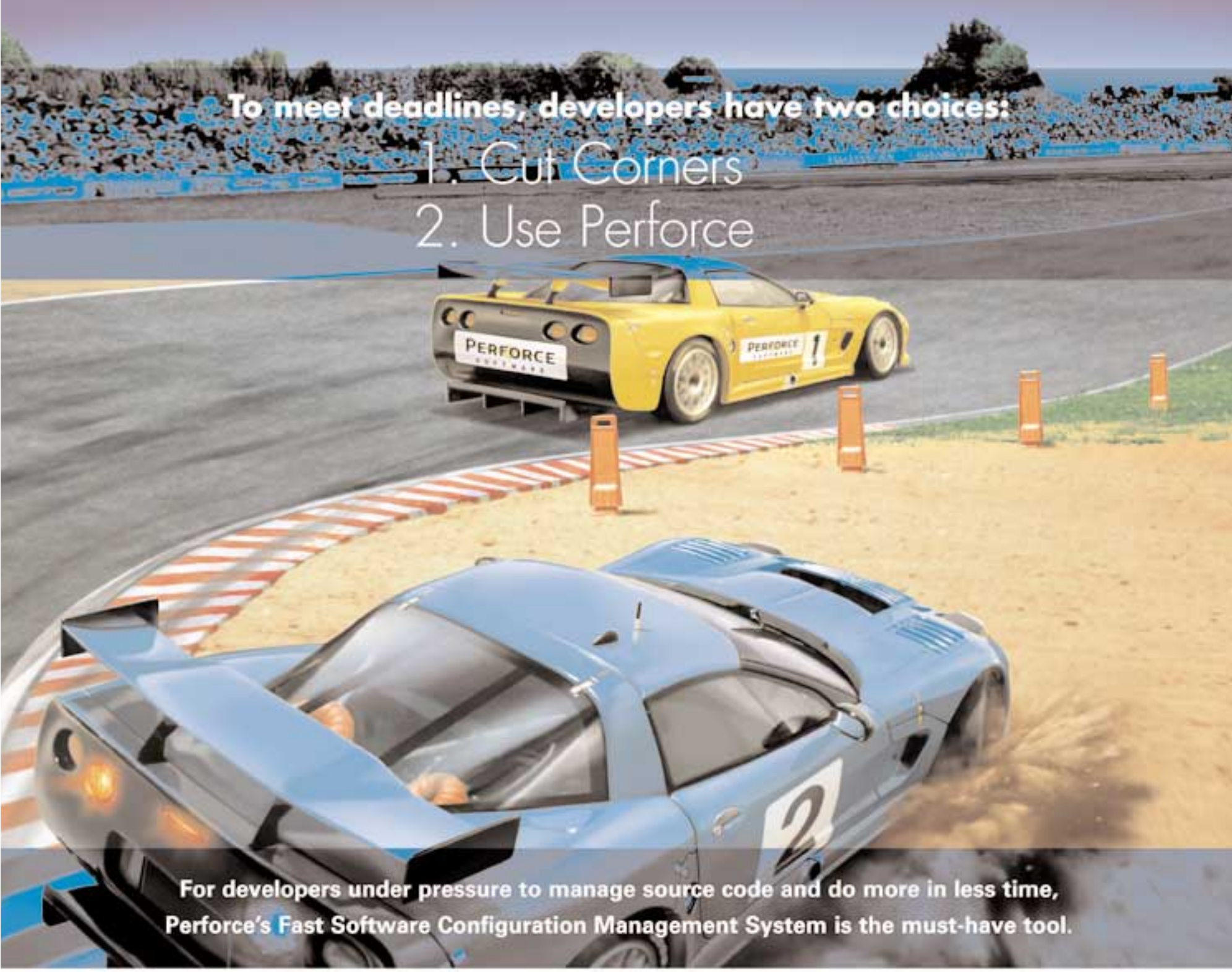
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# Intrinsyc CerfPDA Drives Wireless

## Device development platform now supports Windows CE .NET

**BY EDWARD J. CORREIA**

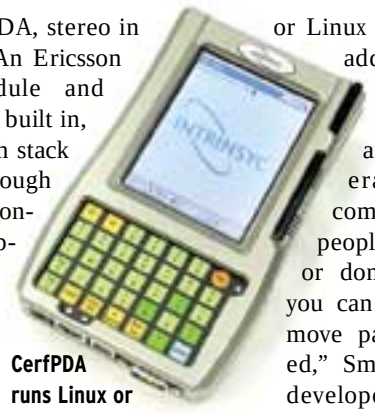
Embedded tools developer Intrinsyc Software Inc. has released a set of wireless drivers for its CerfPDA, the tablet-style hardware reference platform released late last year that it says simplifies development of enterprise mobile application prototypes. The device also now supports Windows CE .NET, giving developers a choice between Microsoft's latest version of Windows CE or Linux as their base operating system.

**OS components can be added or removed, says Intrinsyc's Smith.**

According to Justine Smith, CerfPDA's product manager (www.intrinsyc.com), developers receive the unit with their selected operating system preinstalled. "There's an image already on the device so you can boot up the device and start working on it when you get it," she said.

The new wireless drivers will support 802.11, GPS, CDPD and other wireless protocols with hardware added through the PC Card slot. Smith said that potential uses for the CerfPDA include building automation, test and measurement, warehouse and inventory management and various field service applications that need to quickly transfer data to or from a central store.

The CerfPDA is built around the Intel SA-1110 StrongARM processor, and in its default configuration includes 64MB SDRAM, 32MB Flash, a PC Card connector, an alpha-numeric keypad and a 3.8-inch touch-sensitive color LCD panel. Ports in the base unit include Ethernet, RS-232, USB (client), IrDA, stereo in and mono out. An Ericsson Bluetooth module and antenna also are built in, but no Bluetooth stack is included. Through an expansion connector, developers can add USB mastering or additional PC Card, Flash, I/O, Ethernet, analog-to-digital or general-purpose I/O boards.



**CerfPDA runs Linux or CE .NET out of the box.**

Also included are tools to rebuild the Windows CE or Linux image and to add developers' own applications. "There are various operating-system components that people either want or don't want, and you can add and remove parts as needed," Smith said. For developers planning to target Windows CE .NET, a copy of Microsoft's Platform Builder also is required; the kit includes a board support package. Applications can be built with Embedded Visual Studio or any other tools that target Windows CE, she said.

As for Linux, "we provide our own kernel…and a kit that can update the kernel," she said, adding that GNU and other generic open-source development tools can be used to target the platform. Smith said the CerfPDA has been tested with Red Hat's Linux and eCOS operating systems as well as with MontaVista Linux. Debian and other Linux distributions will follow soon, she added.

Pricing of the CerfPDA development kit starts at $2,400, including the target platform, a choice of Windows CE .NET or Linux and the corresponding kernel configuration utility, a serial debug board with JTAG CPU interface and access to all other device and bus signals, plus three months of support. ▮

# WEBSPHERE GOES THE LAST MILE

## Unified IBM tools extend enterprise apps to handhelds

**BY EDWARD J. CORREIA**

SAN FRANCISCO — IBM Corp. announced at last month's Embedded Systems Conference a set of development tools and a Java runtime that the company says extends the WebSphere application environment to cell phones and handheld computers. The release of WebSphere Studio Device Developer and WebSphere Micro Environment, due at the end of last month, completes the company's strategy to provide an end-to-end solution for enterprise applications and a unified set of development tools.

Marc Erickson, project manager with IBM subsidiary Object Technology International Inc., said that the Device Developer J2ME integrated development environment will offer much of the same functionality as the company's Visual Age Micro Edition (VAME), which is now discontinued.

According to Erickson, developers familiar with VAME will feel comfortable switching to the new environment. "Device Developer is consistent with what Visual Age offered," he said, adding that developers building enterprise applications with WebSphere Application Studio will now see the same interface if they target handheld devices. "Now product lines from our Pervasive Group are aligned with the enterprise tools and extend end-to-end. The same interfaces you used for server apps you [also now] use for devices."

In addition to CLDC/MIDP support, Device Developer now can build applications to the CDC and Foundation profiles, which, according to Angus McIntyre, IBM's product manager for embedded Java, lets developers target more connected, less resource-constrained devices. "This is significant because of the robustness of services that you can build," which include faster user interfaces, he said. Applications can be compiled ahead of time, executed through IBM's JIT compiler or in combination, he said.

Erickson said that in addition to running as a standalone IDE, Device Developer can be run as a set of plug-in extensions to Eclipse, the generic open-source IDE project launched by IBM late last year. He said this permits developers to seamlessly integrate the environment with other Eclipse-compliant development tools.

The tools also reportedly include a remote debugger for on-target application testing, called MicroAnalyzer, which gives developers the ability to analyze performance during execution on the device. "MicroAnalyzer shows you hot spots in your code where processor and other resources are being used," McIntyre said, and information is fed back to the linker to allow developers to fine-tune the performance of their applications.

The WebSphere Micro Environment is the company's renamed J9 clean-room JVM, and is available now for iTron, Linux, Microsoft's Pocket PC, Palm OS and Qualcomm's BREW. ▮

# LynuxWorks Delivers on Compatibility Promise

## Binary interface in LynxOS 4.0 lets OS run Linux applications

**BY EDWARD J. CORREIA**

RTOS developer LynuxWorks Inc. has released LynxOS 4.0, the first version of its real-time operating system that it says offers binary compatibility with Linux applications—finally delivering the capability more than a year after it was first previewed. The company also claims the new version has better network performance and is more deterministic, with boosts in task performance of as much as 30 percent.

LynuxWorks develops and markets a trio of operating systems, each with its own target slice of the market—from soft real-time with Blue Cat Linux, to Blue Cat RT for applications that require some level of determinism, to LynxOS, its hard RTOS marketed to aerospace, defense, military, telecom and communications developers.

According to Inder Singh, president and CEO of LynuxWorks (www.lynuxworks.com), the most significant change in LynxOS 4.0 is a new application binary interface, which he said lets the operating system run Linux applications without change. "Embedded developers can be assured that as their products and market change, they can quickly migrate between operating systems, or add new products that are compatible with very little effort."

This is accomplished, he said, by dynamically linking libraries shared between LynxOS and Linux. LynxOS 4.0 also includes an enhanced TCP/IP stack that now supports IPv6 and IPSec and adds a host of additional capabilities, including an integrated firewall.

The company also has released JumpStart for Communications, the first in a series of packaged software and support offerings—in this case, aimed at network and communications developers. Starting at $50,000, the package bundles LynxOS 4.0 with software drivers, middleware, third-party applications and a block of consulting services.

"JumpStart packages will save developer time in integrating operating systems and microprocessors, and eliminating the need to purchase or develop middleware," claimed Singh. Future packages will target military, aerospace, telematics, handheld devices and wireless. ▮

# FastObjects With JDO: 'Write Once, Persist Anywhere'

## Poet database components also to support fail-over, encryption in SDKs

BY EDWARD J. CORREIA

On the heels of the official release of the Java Data Objects specification, embedded object database developer Poet Software Corp. in March was scheduled to release a set of JDO extensions for its FastObjects database SDKs that it says will enable developers to access data from JDO-compliant databases without the need to include database-specific code.

According to Dirk Bartels, president and CEO of Poet (www.poet.com), the JDO specification just approved by the Java Community Process is an important advance for Java. "JDO fills a hole in Java persistence that existed for a long time," he said, and the specifications give developers new independence from database vendors. "Now JDO applications can be 'write once, persist anywhere.'"

FastObjects consists of a trio of object database components and SDKs for HP-UX, Linux, Solaris and Windows. The j2 SDK is for single-user, single-connection, all-Java systems such as handheld computers and other resource-constrained devices. The e7 kit is intended for single-host, multiuser C++ or Java embedded systems without such resource and power constraints. The t7 SDK is intended for multihost transactional databases. Per-seat pricing for the SDKs starts at around $2,500.

"Most applications need to store some amount of data, whether it's a transaction looking for relational data, a financial app looking for an object or a configuration in a flat file," Bartels said, adding that before JDO, the alternative when accessing these objects required developers to include database-specific code in their programs. "You had to write the mappings yourself" or use third-party mapping software, which sometimes limited developers to a particular platform or database format, he said. With JDO, "once you come up with an object model, you write in Java and JDO figures out the corresponding relational database model," saving developers a lot of time and extra coding, he said.

Also in March, the company was scheduled to release security extensions for its SDKs that it says will permit SSL encryption of data at any level. "The security module goes as far as you need," said Bartels, and can include only stored data, or extend to indexes and data in transit. The security features will be specifically important for developers building applications for the health-care industry, Bartels added, where increased enforcement of U.S. Food and Drug Administration regulations regarding electronic patient records requires a renewed attention to security. "People are nervous about sending the information over the Internet because it's not your average client/server environment."

The company also will add fault tolerance to its back-end database transaction system with an extension to t7. "When you build databases, it's all about reliability. Data cannot get lost," said Bartels of the motivation behind the new features. "Basically it's a stand-by server which becomes active if the primary server fails," he said. Bartels claimed that the server cutover performance is superior to that of competitive products. "Ours takes about 30 seconds to come up; Microsoft Cluster [Server] takes four to five minutes." ■

# GREEN HILLS HAS RENEWED INTEGRITY

BY EDWARD J. CORREIA

Embedded systems developer Green Hills Software Inc. has released Integrity 4.0, the latest version of its RTOS that the company says delivers a host of enhancements and now supports ARM processors, including Intel's XScale.

Among the new tools is ResourceAnalyzer, which, according to John Carbone, vice president of marketing at Green Hills (www.ghs.com), is analogous to Microsoft's Performance Monitor. "It gives developers graphical visibility into the target system behavior during application execution to find out how well it meets performance objectives," by tracking CPU and RAM utilization and other system attributes. The tool, which can be executed remotely in deployed systems and those under development, also includes logging capabilities. "You can see what's been happening in the device over a period of time," he said.

Integrity 4.0 also includes an enhanced version of EventAnalyzer, the company's real-time event trace tool that Carbone said displays application tasks and task transitions graphically. "Now you can click on tasks to link directly to the relevant source code," permitting developers to set break points, check variables or perform other diagnostic analysis, he said. A new project wizard also is included, which helps to automate the process of beginning new device development, Carbone said.

Licensing for Integrity 4.0, which also supports a multitude of MIPS- and PowerPC-based boards, starts at $15,000. ■

# ELC DELAY

◂ continued from page 1

One member expressing frustration over delays was Mike Thompson, a member of Motorola Inc.'s iDEN Subscriber Group. "The ELC is going to have to make its decisions quickly for it to be successful; [Windows] CE and Symbian are ready and waiting," said Thompson, who proposed a working group exclusively for wireless developers because of possible delays in implementing general standards. "Deciding on the kernel and file systems will be easy. The hard part will be the GUI" and other areas, he added.

In February, the ELC (www.embedded-linux.org) cleared a major hurdle when it reached an agreement on how to develop and distribute the intellectual property that would result from standardization, ending a year of legal wrangling. At that time, Singh indicated that a fairly strong consensus existed among ELC members on what the initial specification for core services should be. "We are not trying to create anything [new], but to make sure that all the embedded Linux distributions don't diverge from each other. It's really just a matter of pinning down the details and filling any holes. We expect to move pretty fast through this first version of the specification," he said at the time.

**Linux provides an ecosystem around which to build an industry, says the ELC's Singh.**

But when pressed at the meeting for a firm release date for standardization of core services, Singh, who is also chairman of embedded Linux vendor LynuxWorks Inc., would not commit, stating instead that he hoped consensus and a test suite could be completed before the end of the year, and that work on noncore standardization could continue in parallel.

According to Singh, development of core services and compliance testing will get top priority. "The main objective is to make sure that there's a branded specification and test suite that every embedded Linux vendor can use," said Singh. "Then [for] anybody who's building an application, middleware or a product, once you know it runs against that platform, you know it will work on any vendor's Linux product."

Even if the group successfully develops standards, there's no guarantee that all the members will conform. Matt Harris, CEO of embedded Linux developer Lineo Inc., said he will remain cautious. "We would favor changing [to a standard], but first we would make sure it favored our customers. If adopting a standard slowed development, we would consider that a step backward." Among Lineo's offerings is OpenPDA, a Linux-based software platform that is currently deployed on the Sharp Zaurus handheld computer. "We believe in standardization…but consortia drive me nuts because of their long decision-making process," Harris said.

Slowing the ELC's progress has been indecision on procedural issues, particularly those surrounding the working groups. "The ELC has yet to decide how to proceed as a standards organization," said Murry Shohat, executive director of the ELC. In April 2001, the board invited proposals on such procedures, and is considering those submitted by Open Group, Free Standards Group and others to decide how the balloting process will work after a specification is written.

Red Hat Inc. CTO Michael Tiemann will supervise the process of assembling the working groups, following procedures proposed by the large Linux developer. "Michael Tiemann has the respect of the community and the technical capabilities demonstrated by his past to be the person to deal with the working group proposals and ideas in an effective manner," Shohat said.

Singh said the first phase of standardization will offer developers a guaranteed set of services for operating-system and file services, and other core services including the process model and threads, and a set of APIs based on POSIX.13 profiles.

The core specifications are being developed by a working group comprising the technical managers of all ELC board-member companies. The overarching objective, said Singh, is to create a standardized platform and developer ecosystem. "It's analogous to what has happened around Windows. There hasn't been anything like that in the embedded market, and Linux provides the potential platform around which companies can build an industry."

The deadline for submission of working group proposals is May 31. Proposals will be selected and working groups announced at the LinuxWorld Conference in August, according to Shohat. ■

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# Software Testing: The Internet Changes Everything

BY JENNIFER DEJONG

Internet applications aren't like other applications.

For one thing, they have more moving parts and complex interdependencies than applications contained within company walls. For another, by definition they run in a highly dynamic environment that the corporate developer can never completely control.

As businesses continue to build and extend their Internet applications, these two factors are having a dramatic impact on the way they test software. The rise of distributed Internet applications is redefining how companies manage the quality-assurance process, catapulting them beyond the find-the-bug, fix-the-code mindset that has long defined software testing.

"Developing an application in its entirety and throwing it over the wall to the QA team is no longer a valid solution," said Simon Berman, director of product management for Mercury Interactive Corp. (www.mercuryinteractive.com), a company that sells enterprise testing and performance management software for Internet and other applications.

Internet apps must be tested end-to-end, says MetraTech's Culbert.

"An Internet application is a very different creature from a compiled desktop application—[meaning] you have to test, end-to-end, how things will happen," said Jim Culbert, vice president of technology at MetraTech Inc. (www.metratech.com), a provider of Web services-based billing, customer-care and revenue-sharing software. From what the end user sees, to the middle tier that processes transactions, to the back-end databases, Internet applications are made up of a complex web of interactions, he said.

In addition to a multitude of components running on many servers, some outside of the company firewall, there is a wide range of factors that impact performance, said Ravi Venkatesam, vice president of operations and co-founder of Atesto Technologies Inc. (www.atesto.com), which provides Web-based testing and performance management tools and services.

"By the time two machines interact to exchange data, you have multiple third parties in between—ISPs, Internet backbones and so forth," he said. "The very nature of traffic on the Internet makes your server behave differently—there are just so many dependencies."

And as if the technology hurdles weren't high enough, there is a compelling business reason for companies to abandon traditional ways of testing software: Internet applications directly expose companies to customers and partners in ways that rarely happened in the past. When their sites fail to perform as intended, that failure is there for all the world to see.

"There have been a lot of shortcuts taken," according to Deb Kaplotsky, director of product management at Web testing tools vendor RadView Software Ltd. (www.radview.com), referring to the well-publicized reports of Web outages. Many sites crashed as a result of their inability to handle traffic spikes, she said.

## FIRST COMPONENTS, THEN SITE

To avoid such setbacks, said Kaplotsky, you should test each component as you build it into your application, then test the site as a whole to get a sense of how it performs under varying conditions.

Problems are more likely to appear in integration testing, says Flashline's Wallace.

Given the modular nature of Internet applications, it's logical to do component testing. But at the heart of any Internet application-testing strategy is the two-part approach—first the components, then the site. "There are bugs that will show up in component testing," said Adam Wallace, CIO of Flashline Inc. (www.flashline.com), which sells tools to help developers reuse software components. "But it's much more likely that problems will manifest themselves in integration testing."

Just how critical it is to test at the integration level became clear when Java developers began to make wide use of Enterprise JavaBeans, said Wallace. "Testing EJBs is not like testing JavaBeans." Because an EJB has so many dependencies, you have to move beyond the component-level testing to figure out what actually happens when an EJB interacts with the pieces of the application it was designed to communicate with, he said.

Testing the entire site is the crucial test, says Bowstreet's Hartford.

That's also the case for Web services. "The most important test is the test that encompasses the entire site," said Lance Hartford, software performance engineer at Bowstreet Inc. (www.bowstreet.com). The company sells software that enables businesses to build Internet applications using Web services.

"Say, for example, you are building a Web portal site and plan to incorporate in it several Web services—the weather report, stock quotes, news headlines," said Hartford. When you test each service alone, you might discover each performs flawlessly. But when you go to test the entire site, he said, performance slows to an unacceptable crawl. Component-level testing could not detect that problem.

MetraTech's Culbert said testing a Web service is similar to testing an API. Because both are dynamic snippets of code, testing them is many orders of magnitude more complex than testing, say, a static HTML page. You have to find out how the API will respond to each parameter it calls, he said. And since Web services travel over the Internet, that adds yet another layer of complexity. "With an API, at least you know you can't lose the parameter," said Culbert.

That's just one of the challenges developers face as they move toward Web services. A host of others—ownership, performance management, security and trust—are in the midst of being addressed by service providers and others that aim to speed up the widespread adoption of Web services.

### TEST ON THE WEB

Of more immediate concern to developers and QA professionals is how to actually go about testing Internet applications.

The first step is to get out of the QA lab and onto the Internet. "Testing Web apps on only the corporate network is like evaluating an SUV in the factory," said Atesto's Venkatesam. You don't care how it performs indoors, he said. "What you really want to know is, 'How did it do on the rugged road?' "

A QA lab is a sterile environment, added Mercury's Berman. "You cannot simply ignore the Internet and go into production. If you do, there are major pieces of the pie that have not been tested."

To test your Internet application, you have to consider the end user's point of view, said Venkatesam. What kinds of configurations are they coming to the site with? What do they do when they get there? "You need to simulate the real world using business test cases," he said.

Doing so entails creating scripts that carry out typical business tasks. At a consumer banking site, said Venkatesam, that might be: Log in, check balances, transfer money between checking and savings and then log out.

Another example: Before MSNBC launched its Olympics site, using RadView's WEBLoad, testers created scripts to check scores, vote and view results, as well as handle other typical tasks, said Kaplotsky. They also determined what kind of connection users were coming in on—T1 lines versus dial-up modems—and optimized the site accordingly.

Also essential in determining user behavior, said Venkatesam, is factoring in how outside events—a news story, a sporting event, an advertising campaign on TV—can drive traffic to your site. A spike test will determine whether the site can scale to accommodate unexpected increases in traffic.

### IT'S NOT JUST PERFORMANCE

With all the focus on performance, it's easy to forget about errors. The question is, "Are you getting the correct result back?" said Dan Hay, a lead product manager with the Visual Studio .NET group at Microsoft Corp. To successfully test an Internet application, the developer must look at the response to typical queries, he said. "For instance, when a user on a travel site types in a flight number, does he get the confirmation number and ticket number back? Who cares how the site performs if all it gives me is an error message?" he said.

Given the need for such comprehensive testing, it's not cost effective to write your own scripts, said Adam Kolawa, founder and CEO of ParaSoft Corp. (www.parasoft.com) and the co-author of the book "Bulletproofing Web Applications."

Many companies are building entire systems to test one app, says ParaSoft's Kolawa.

"A lot of intelligence is already in the code," Kolawa said. "There are software tools to extract this intelligence and figure out how to test it." ParaSoft sells error-detection tools for C/C++, Java and Web applications.

But that's not what the majority of companies are doing—they are building entire systems simply to test a single application, said Kolawa. "That's like trying to test chips by installing them in your TV to see if they work—you change channels, look at the screen, but you miss a lot this way."

To increase the efficiency of the testing process, it's helpful to move past the mindset that says developers write code and the QA people run tests. Making that happen is tough, said Mercury's Berman. "Developers want to work with development tools. Testers want to work with testing tools," he said. One practical way to break down that barrier is to attack the problem at the product level—incorporating testing capabilities into the integrated development environment that the developer works in, said Berman.

To that end, Mercury recently announced that its testing and performance tools LoadRunner and Astra LoadTest are now integrated with Microsoft's Visual Studio .NET. That means .NET developers can work in the environment they are accustomed to, and click on a button to invoke testing capabilities, said Berman. Because it enables the QA guys to reuse the same test scripts as the developers, it increases the efficiency of the testing process, he added.

Mercury also integrates its testing tools with WebGain's VisualCafé Enterprise Suite and plans to announce support for other Java environments in the near future, said Berman.

Developers and QA experts are not the only ones who need to work together; business line managers and customer service professionals are also getting in on the act. Sujata Keswani, a software development manager at Fremont Bank (www.fremontbank.com), is a key player in the ongoing development of the company's consumer banking site, using Atesto's tools and services to assure the bank's Web applications will work as intended.

Software testing has been viewed as a 'stepchild,' says Atesto's Venkatesam.

She said that the QA process now involves many more players than it did when the bank was building non-Internet applications. Business line managers have a considerable say in how the site works, and customer service reps have become an invaluable source of feedback. "They are our interface to the bank's customers. That's how we find out 'Did it scale, is it too difficult to navigate, are there any errors?' " she said.

### THE JOB IS NEVER DONE

That process of improving the site is never complete. "Web applications are extremely dynamic," according to Atesto's Venkatesam. "There are multiple parties involved, and things keep changing." In order to keep up, you have to not only test, but monitor performance and tune the applications as well.

That process should help propel software testing past adolescence. "Testing is mature in other industries—shipbuilding, cars, airplanes," said Venkatesam. "But for software, testing has always been something of a stepchild."

But as businesses continue to increase their commitment to the Internet, that has to change.

"QA is still a black art—there are so many people just getting away by the seat of their pants," said MetraTech's Culbert. "But as we go into the Web environment, one thing is sure: You won't get away with that anymore." ▮

# QA Challenges For Web Services

## Persistence, pervasiveness, security are key

BY JENNIFER DEJONG

As the industry moves cautiously toward Web services, proponents are no longer merely extolling the virtues of the plug-in technology that promises developers a faster, better and cheaper way to build Internet applications. Instead, they are asking and attempting to answer some difficult questions.

The challenge for the providers of Web services is to keep the services up and running and make them work in anyone's environment, said Jim Culbert, vice president of technology at MetraTech Inc. He and others with a vested interest in the technology agreed that two key things have to happen before mass adoption can occur. An operational infrastructure robust enough to guarantee the uptime and the availability of Web services must emerge. And concerns about security and trust must be addressed.

Web services today are at the point Java was at five years ago, says Mercury's Berman.

Although the challenges loom large, adoption is under way. "People are starting out by using their own Web services, within their own firewall," said Dan Hay, a lead product manager with the Visual Studio .NET group at Microsoft Corp.

Those who aren't there yet are laying the groundwork, said Simon Berman, director of product management for Mercury Interactive Corp. (www.mercuryinteractive.com). "Our enterprise customers are embracing the protocols [associated with Web services]—XML, SOAP, HTTP," he said, noting that Web services today are at the point Java was at five years ago. Adoption may be slow and painful, but it is going to happen, he said.

The root cause of the pain is that Web services (unless you write your own) reside on a server in someone else's domain. "You don't have the power or the authority to make sure [the Web service] will scale to your satisfaction," said Lance Hartford, software performance engineer at Bowstreet Inc.

The first step in getting over that hurdle is for Web service providers to make readily available information pertaining to performance and testing—proving, for example, that their Web service will scale, said Adam Wallace, CIO at Flashline Inc.

But that addresses only part of the problem. "You can simulate a test for, say, 50,000 users, and publish the results," said Microsoft's Hay. "But that doesn't mean your server won't go down. The stuff that you can't predict is

▸ continued on page 24

# QA CHALLENGES

◂ continued from page 23

how it performs on the Internet," he said.

The contract between the Web service provider and the user of that service essentially ends at the component-based level of testing, said Steve Kolak, a product manager at Empirix Inc. (www.empirix.com), a maker of testing and monitoring solutions for Web and other applications. But there is still so much that can go wrong, he said. "The vendors of Web services would have us believing that the protocols associated with them—XML, SOAP, HTTP—are lightweight. But in fact that can add three or four layers to an application—potentially a huge performance impact," he said.

To address those issues, a movement into an operational maintenance and monitoring of Web services is beginning, said Microsoft's Hay. The concept is not new, but applying it to Web services is. "Companies such as Computer Associates have offered monitoring and testing services for years," he said.

"If you're a Web service provider, your contract with the world has to be much more serious," said MetraTech's Culbert. "For the bits-and-pieces model to work, providers will have to support service-level agreements, guaranteeing uptime. Otherwise penalties are involved," he said.

**Contracts end at component testing, says Empirix's Kolak.**

Service providers and others admit that security concerns add yet another layer of complexity—but most were reluctant to spell out in any detail how security will work. Security issues—authentication, authorization, protection of the server on which the Web service runs—are not new, but how they will be applied to Web services is. "The technologies have been around for some time," said Eric Olsen, a program manager with the .NET Framework security group at Microsoft. "But there is still concern about integrating systems beyond the firewall," he said.

"Companies are carefully exposed," said Culbert. "A guard stands at the front door. But today security is pretty coarse-grained. Web services will require a finer-grained security mechanism." He said that issues begin to arise at the authorization level. "We need one means of authentication that works across all the components of Web applications," said Culbert.

The .NET Framework, said Olsen, allows developers to plug in additional security mechanisms at each level. For instance, at the authentication level, you have SSL and client certificates in place. But you also can plug in another layer, for example, a mechanism that will make sure the account of the person accessing the service is up to date.

But, ultimately, Web services is a business relationship between the provider and the customer that embeds them in its applications. "You can't guarantee everything through technology," said Bob Hayes, vice president, senior architect and design manager at the global bank ABN AMRO (www.abnamro.com). Hayes and his team are providing Web services to partners and customers. "There is no technical solution to trust—[when a customer says,] 'I am going to send you a million bucks' and trust you with it," he said. ■


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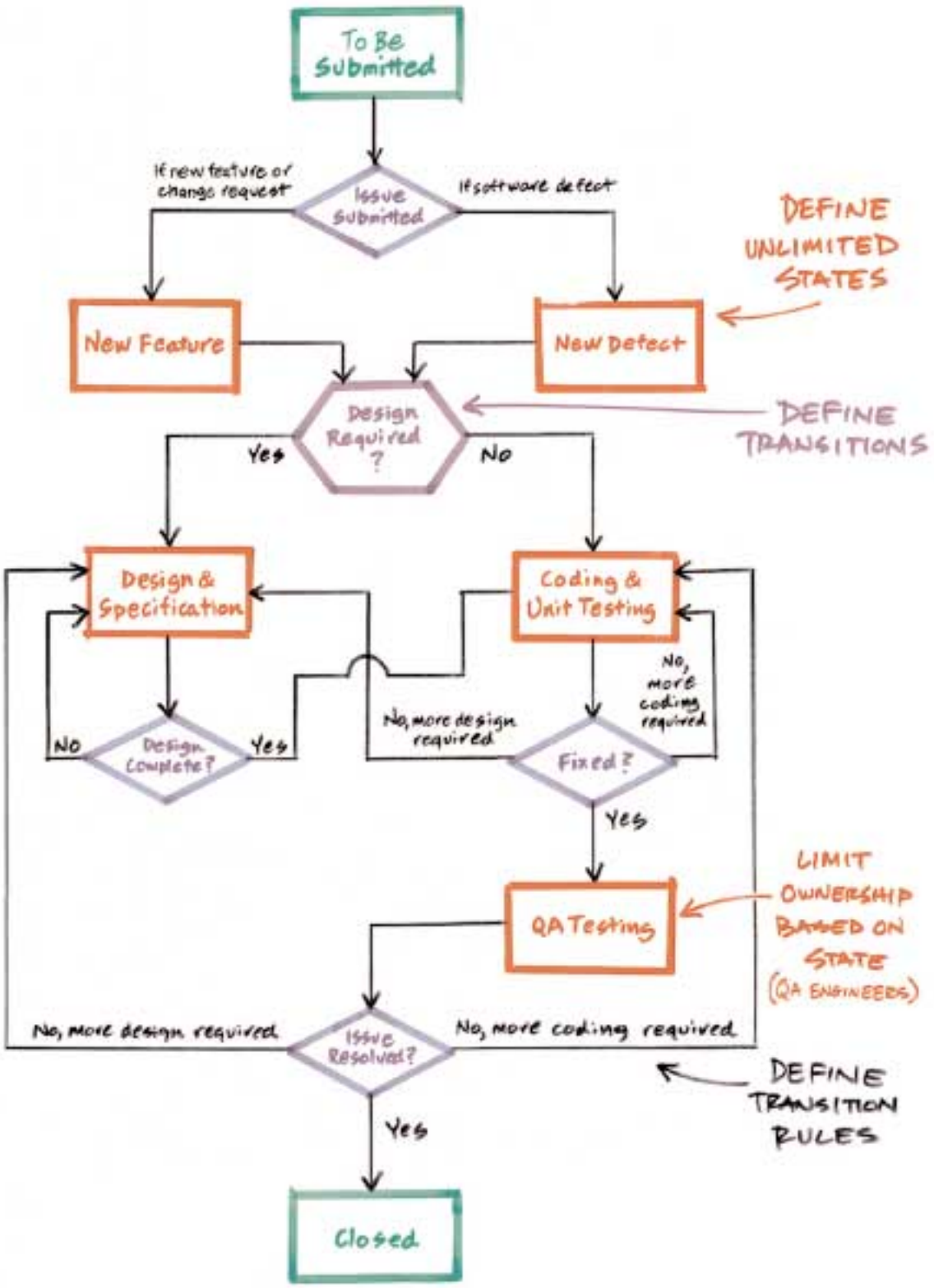


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EDITORIAL

# A Potential Nightmare

As the use of Web services matures, it's likely that core program logic and massive amounts of functionality will be accessed using XML/SOAP/WSDL, covering everything from mathematical computations to database updates. The advantages of this approach are trumpeted by every Web services tool and platform maker. The disadvantages—that software development teams lose control of their bits—is less often discussed.

Take a traditional Web application. Within the *n*-tiered architecture, coding problems become more difficult to spot, since they can be living in the Web pages or script, in code within the app server, or in database-stored procedures. Fortunately, testers and developers at least know where to look for these problems, and in most cases all of the disparate code is readily accessible on local machines or source-code repositories. Although testers must initially trust in the correct functioning of the database and app servers' own binaries (unless they are using open-source solutions), they can track down and verify the correctness of all of the program and presentation logic.

In a traditional setting, the only areas of reduced program-logic visibility would be in commercial EJB, CORBA or COM components. In most cases, these are few and far between. Even then, however, the code is executing locally, so testers or developers can isolate and certify the binaries before incorporating them into an application. Essentially, white-box testing is always possible.

It's also important to note that in traditional development, managers have complete control over the revision cycle of all tiers of the application, as well as of any commercial parts (the app server, the Web server, the database server). You don't deploy any revisions to any of the components until they are thoroughly tested, and until the complete solution is also thoroughly tested with that updated component.

With Web services, everything changes.

Web services advocates say that as long as the WSDL interface to the Web service is properly documented, users of that Web service don't need to worry about the underlying implementation. In fact, they say that is an advantage: The Web services author can change the implementation, and as long as the public interfaces don't change, no problem.

That's a familiar concept to any object-oriented developer. A difference is that the software development manager would know when an object or component's code was changed and would run changes through the QA process before deploying them. That's not guaranteed with Web services, where an essential Web service can change and alter the behavior of a deployed app without anyone's knowledge.

It's a potential nightmare black-box scenario. Not only can't you see inside the Web service to see how it works, you can't even control its release cycle. You're utterly dependent on the Web services producer to ensure that upgrades or bug fixes won't change the behavior of the Web services application.

These dependencies should worry any development manager considering the use of Web services, if the source code for those Web services is not available to be examined and validated, or if the Web service is hosted externally, either commercially or from elsewhere in your business. ▮

GUEST VIEW

# CRM'S DIRTY LITTLE SECRET

*"Your inquiry about viewing a Guest View opinion piece has been received by SD Times' editorial department. You will receive a response, including a specific quantity of journalistic content, within 6–8 business days."*

After a week or two had gone by, you'd likely have forgotten all about your desire to read this column. Let's face it, automated e-mail responses like the fictitious one above might be appropriate in some cases, but only a few, and they're not going to make your customers happy.

BARRY BRIGGS

In many a company, the left hand not only doesn't know what the right is doing, it may not even be aware there is a right hand. A call center that isn't coordinated with a print-based promotion or an automated e-mail response system only convinces customers, rightly or wrongly, that the company has barricaded itself behind a shield of automated systems and impersonal technology designed to keep its customers at bay. There's no surer way to alienate customers in the name of serving them.

Many, if not most, businesses lack a comprehensive, unified strategy for managing customer interactions. In fact, few enterprises even possess a single definition of a customer. Does your enterprise have a common customer record shared across all touch points and back-end systems?

Compounding the problem is that most customer relationship management (CRM) systems are both incredibly sophisticated and highly focused—on sales-force automation (SFA) or campaign management, to pick two examples. Implementing such complex systems might solve your SFA problem, but it leaves no time or budget for coordinating the activities of that SFA system to the e-commerce Web site or call center. Ideally, once a rep contacts a prospect, the personalized Web site should reflect that meeting—perhaps with a personalized "thank you" message right on the home page.

But here's a scary fact: Analysts estimate anywhere between 40 percent and 70 percent of all CRM implementations either fail or do not meet expectations. Indeed CRM can actually drive customers away. Yet the promise remains that done right, CRM enhances the value of that asset so critically important in these challenging economic times: the customer. But as we shall see, doing it right means more than deploying a few systems and throwing a few switches. The industry has an open secret no one wants to talk about: A lot of the current technology actually inhibits the improvement of customer relationships. It's standing in its own way, creating two new problems for every one it solves. Why is that?

One problem is that today's customer is virtual—made up of a changing inventory of conflicting data points trapped in "silos" across the enterprise. Step one of a well-thought-out CRM strategy involves understanding—in some cases, discovering what it is a company knows about its customers, where it knows it, and how to leverage it.

In short, companies need to shake themselves awake from the CRM nightmare and take a systematic approach—at the level of data—to making CRM work. This starts with four steps: discovering all repositories where customer information resides; understanding what the repositories contain; making sure all systems have access to all of the information; and developing a common understanding across all systems.

The idea is that all CRM systems recognize the same busi-

## LETTERS TO THE EDITOR

### KNEE-JERK REACTION

I think that Christina M. Purpi has had something of a knee-jerk reaction ["Has Java Hit a Fork in the Road?" Jan. 1, page 1, or at www.sdtimes.com/news/045/story1.htm].

This has been the approach from suppliers from the year one—take a standard, then bolt on extensions to try to gain an advantage. Go back a few years to the Explorer/Netscape battle; both had bolt-ons that weren't HTML standard. And CORBA has the same thing with things like Smart Agents (Orbix). J2EE is portable; if you choose to commit to a single supplier and its extensions, you've made a commercial decision. That isn't the fault of any technology. But BEA and IBM would do well to ensure that their extensions work on as many J2EE engines as possible, as it keeps the potential number of buyers of these extra suites of functionality as big as possible.

**Phil Wilkins (IEng MIIE)**
Consultant/Software Architect
Hi-Q Systems

### SUPPORT THE LITTLE GUY

I have read your article about speech technologies ["General Magic Talks to Java Web Developers," Jan. 15, page 6, or at www.sdtimes.com/news/046/story13.htm]. I think that General Magic had more time invested for such technologies than other companies, and its VoiceXML products are now available. IBM also supports this technology, but no one knows whether Salt or VXML technologies will gain the goal. We also know that Microsoft is working on this, and we should not forget it has billions of dollars to finance such speech-technology development. We can be sure that Microsoft will do everything to set the standard in this speech market. There will be a fight like David and Goliath, and we know the outcome of that one. The conclusion is, we should not underestimate the power and abilities of such small companies as General Magic; they are very motivated and busy working to make the standard. Therefore, I ask all developers to support VXML in developing applications.

**Mario Rossetti**

### DELIVERING BE'S PROMISES

I am still an enthusiastic BeOS developer and just read your article on Palm's decision regarding BeOS licensing ["Palm on BeOS: Access Denied," Feb.1, page 4, or at www.sdtimes.com/news/047/story7.htm]. I even heard something new—I did not know about the $10 million proposal from an eager open-source developer.

However, I think it's bad for Palm, but not bad for BeOS.

It's bad for Palm because

ness events—whether it's a sale on a retail Web site or a change of address in a financial company's database. This could happen through a combination of database triggers, enterprise application integration products and/or custom coding. But what it really comes down to is the following imperatives:

**Gain control of all CRM information.** The most important step to healing CRM is to ensure that all points in the infrastructure understand the same key abstractions. Do all your systems share a common definition of the customer, product and service?

**Understand what's happening—the key business events—at every point in the infrastructure.** What business events are most important to you? Is it when a customer buys something or signs a contract? Is the company most interested in potential selling opportunities when, for example, a customer changes address or when he or she expresses interest in a given product?

**Coordinate the interactions so the system works as a unified whole.** Using triggers, EAI or custom code, the system needs to let all channels know what the customer is doing. The company's Web site should know, and take appropriate action, when a customer talks to a sales rep and receives an offer.

Indeed companies need specialized software that can create integrated hubs of customer data available across all customer channels, from e-mail to printed service receipt. XML and metadata will bridge the gaps between sales and service systems and CRM. Universal, reusable customer and product definitions let users define, map and manage comprehensive snapshots that all can share. This will help solve the major problem in CRM today—the inability to manage customer-related data across the enterprise.

We need software to elevate CRM data management to a strategic level by creating enterprisewide business definitions that forge the missing links. Aligning operational and analytical CRM unites systems that automate call centers and sales-force efficiencies, for example, with creative marketing promotions and e-mail campaigns that boost customer loyalty and drive sales.

A front-office-related metadata repository accessible anywhere in the enterprise allows a database manager to set up an e-mail promotion through a simple GUI by creating a new customer definition—single parent households, for example—with data culled from otherwise isolated call-center, sales and service systems. XML and metadata tagging will create a framework of common business and customer definitions organized in classes that map to the infrastructure's data "silos." With a way of culling scattered customer-related data, companies can begin to coordinate CRM across multiple channels.

Understanding who the customer is and how the computing infrastructure manages the customer are the primary imperatives of business in this decade. Today, the customer is virtual; islands of nonintegrated, uncoordinated data—all about the same customer—reside in any number of systems in the enterprise.

Already the convergence between operational systems and marketing technology has begun, but it hasn't gone nearly far enough yet. Web systems dynamically generate pages based on transaction history as a user clicks on a link. While waiting for cash to appear from an automatic teller machine, a customized product message appears on the touch screen based on the customer's banking preferences. A telesales representative waiting for order confirmation asks questions that drive further personalization based on historic purchase data. A mobile phone is paged when an out-of-stock product is available again. It's increasingly difficult to separate rules that personalize content from rules that deliver content. This underscores the need to begin tying these systems together. It's clear this new lay of the land will require basic changes at the level of technology, strategy and architecture.

It can't really be done as easily as people say it can, if at all. There's that nagging divide between the stuff of CRM—customer data—and the technology of reaching out to prospects and customers. The way things are set up now, true marketing-led CRM can't be done without systems integration. Companies literally drag the customer information they have collected for years from their IT department's mainframe database to a third-party e-mail marketing shop and back.

To create an uninterrupted dialogue with virtual customers, we need to get away from point-to-point CRM architectures that resemble a patchwork of unrelated systems. CRM integrations need to pair customer profiles that match realistic, concrete ROI projections and carefully thought-out business goals with a technology architecture that provides rapid-fire connections—a kind of neural network—between dynamic customer data and unified touch points. Only then will companies stop annoying their customers as their CRM and customer-care systems fall short. ■

*Barry Briggs is CTO and vice president of engineering at Wheelhouse Corp.*

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they let a cheap but promising opportunity slip away that would have earned them money and important presence on the desktop (where the applications are developed, after all!)—they lost a perfect development environment for Palm OS 5 apps and all positive input from an enthusiastic and professional think tank that is the Be developer community.

This input could have improved Palm OS in return, and it would not have cost them a penny, but instead even earn them money. Palm seems so much in a panic about their financial situation that they act in overly cautious and restrictive ways.

Why do I think this is good for BeOS? You just have to look at the steady progress at www.openbeos.org to see that the effort to reimplement the Be API is actively forging ahead and doing well—the latest newsletter gives a good status report: http://open-beos.sourceforge.net/nsl/nsl-11.php.

It's actually not at all too hard to reimplement the excellent BeOS API because the Be engineers did a great job designing it; they did a clean and extensible design, which radically reduces the time necessary to implement it (again).

So from a short-time perspective, it's bad that we didn't get the source from Palm, but as we rebuild the OS on the basis of the NewOS kernel, we have a lot more potential for improvements and a much better product than BeOS could ever have been in the long term. For example, the kernel will be better than the original one, OBFS-performance will be better than that of the original BFS, and the new kits and servers (for example, an app server) will be much easier to extend because we know many things now that the Be engineers could not foresee when they originally implemented BeOS.

Also, we should not forget that it would have taken a long time to understand the BeOS source code! It's always easier to understand one's own code, or at least the code of colleagues, and code that was written in 200*x*, not 199*x*.

It should also be worth watching the "Glass Elevator Project," which discusses (and already implements) future versions and perspectives of OpenBeOS: http://sourceforge.net/projects/glasselevator.

Thanks for covering interesting alternative OSes, and watch out for OpenBeOS...delivering the promises that Be made!

**Gregor Rosenauer**

### NETWARE NEEDS MARKETING

As to Wayne Rash's column "Pinochle on Your Snout," [Feb. 1, page 29, or at www.sdtimes.com/cols/webwatch_047.htm], NetWare rocks! Now all they need is to hire some real marketing people. Their problem has always been one of great technology but nonexistent marketing, at least to the people that make decisions and write checks!

**Ted Miller**

### JINI OUT OF BOTTLE

Your article on Jini ["Sun Dreams of Jini for Web Services," March 1, page 19, or at www.sdtimes.com/news/049/emb1.htm] is the first time I got to know so much about the advantages of Jini, its future potential and present usage in systems such as JMatos (I had not heard of that, too). Its comparisons with UDDI gave me an insight into both technologies.

Do keep publishing more of such articles.

**Lakshmi S. Iver**

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# SUN AND INTEL: SOLARIS 9 AND LINUX

Sun's recent announcement—and its subsequent attempts to recast the message—that the upcoming Solaris 9 probably will run only on SPARC chips marks the first time since the days of Solaris 2.*x* that the company's version of the Unix operating system would know a SPARC-only implementation.

Shortly after this announcement, Sun proclaimed it would start shipping low-end Intel *x*86-based servers bundled with Linux. This second announcement is a stunning turnaround for Sun. You might recollect that for years Sun prided itself on the fact that SPARC scaled from embedded systems to enterprise servers and Solaris could run as easily on the desktop as on big iron. Sun waved this scalability story at Microsoft, whose Windows CE, Windows 9*x* and Windows 2000 server versions were derived from three different software architectures with established incompatibilities. Likewise, it waved the single-operating-system story at IBM, whose platform heterogeneity is even wider than Microsoft's. So, Sun's sudden support of two processor families and two versions of Unix (if we can call Linux a version of Unix) had to be a humbling—albeit correct—move.

Despite Sun president Ed Zander's protestations to the contrary, the abandonment of Solaris on Intel and the newfound support for Linux are tied to each other. The two moves are compelling testimony to a blown opportunity of great significance. Long ago before Linux, when SCO was in its heyday as the premier Intel-on-Unix provider, Sun hatched the plan to port Solaris to Intel and attack the PC market. While Sun might have attacked SCO's customer base of multiuser installations, it would have found this strategy difficult because SCO had a fiercely loyal reseller channel. Actually, Sun had greener fields to sow—had it cared to.

MIDDLEWARE WATCH

ANDREW BINSTOCK

Sun's foray into Intel should have been to aggressively define Solaris on Intel as the operating system for workstations. PCs and desktops could run Windows 3.*x* and MS-DOS, but real workstations would run Solaris. This story had several compelling aspects that could not be ignored. The first was the advent of networking, which was making its way into the fabric of the enterprise. Windows did not have an IP stack at the time, while Solaris supported networking straight out of the box. Solaris also ran in protected mode, meaning it had access to all memory and did not suffer the constraints of 640KB workarounds built into Windows. Finally, Solaris on Intel *x*86 was code-compatible with Solaris on SPARC (except for the small question of big-endian versus little-endian data formats). This meant that with the right encouragement, vendors of Unix workstation apps could bring their software to the Intel market.

However, with all this going for it, Sun fumbled its opportunity. Corporate agendas left the Intel version of Solaris without a champion. Indeed, it remained a tag-along stepchild to Sun's other projects. By this singular lapse, Sun handed the Intel workstation market to Microsoft. And within five years, Microsoft had almost completely chased Sun out of workstations. Today, Sun workstations position themselves against PCs, as can be seen on Sun's Web site. And wherever they compete head-on, the Wintel package is generally an equal or better buy. The sole advantage Sun workstations can claim today—other than SPARC compatibility—is they run 64-bit software. The number of users needing 64 bits on the desktop is not great, however.

What is surprising about Sun's missed opportunity is that Microsoft never hid its intention to go after the workstation market. Its first desktop release of Windows NT wore the appellation of "workstation," and, you will recall, it supported MIPS and Alpha processors in addition to Intel. What could be more clear? Sun simply walked away from the workstation market without a fight.

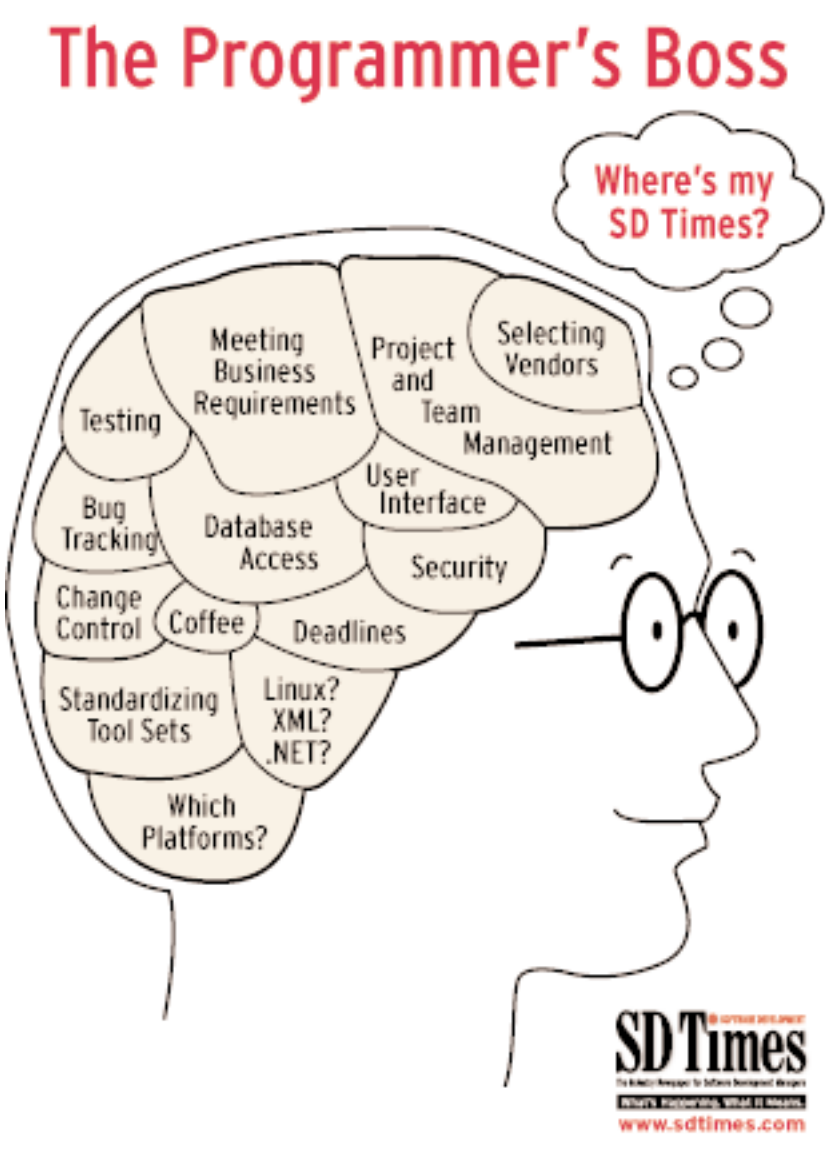
Once Microsoft became the established provider of workstation operating systems, supporting Intel with Solaris increasingly became a liability. Providing compatibility for a small user base and catering to their needs made no sense economically. Intel support had to go. On this basis, Zander is right in saying it had nothing to do with Linux.

However, it is Linux that put the nail in the Intel workstation coffin for Sun. Any faint, if quixotic, hope of selling Solaris-based Intel workstations died when Linux became the de facto version of Unix for these boxes. Even SCO could not stem the tide of Windows NT and Linux combined.

The big question for Sun is whether it can find a sufficiently alluring story with Linux that it can retain some portion of the low-end server market. If not, Sun's future will rely increasingly on selling bigger and bigger iron.

And as DEC, Tandem, Sequent and NCR can attest, selling in this space is treacherous. ▮

*Andrew Binstock is the principal analyst at Pacific Data Works LLC.*

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# JAVA PROGRAMMING, CAJUN STYLE

One beef I've heard about Java over the years is that while it's easy to code trivial things in it, it's often harder to build serious applications from it. Of course, that's true of any programming language. Some companies, like Microsoft and Borland, answered this concern and made a reputation for themselves by giving new and middle-of-the-road programmers easy-to-use IDEs, such as Visual Basic and the Turbo line.

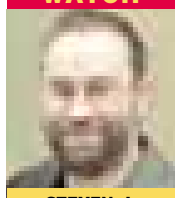
As Andrew Binstock points out in his March 1 column, good IDEs, like Borland's JBuilder 6 and Oracle's JDeveloper 9i, are showing up in the Java universe. That's a good thing because Microsoft is providing 200 million good reasons for Java developers—and everyone else—to switch to Visual Studio .NET. (At least, that's the reported size of their ad budget.)

Borland and Oracle aren't the only ones trying the IDE maneuver, though. BEA's Cajun—now officially named WebLogic Workshop—also is taking a page from the old IDE book. Furthermore, BEA is taking dead aim at Microsoft. Indeed, BEA officials have even said that Workshop is "Visual Basic for Java."

On the other hand, BEA (unlike Borland and Oracle) isn't just re-embracing the power-programmer IDE concept. And it's not just using a clever marketing ploy with the Visual Basic for Java line. Rather, it's the continuation of a long, bitter war between Tod Nielsen, BEA's chief marketing officer, and Microsoft.

Much of WebLogic Workshop's technology dates back to Nielsen's former company, Crossgain, where he was the CEO. Before that, and this is where the story really begins, Nielsen spent 12 years at Microsoft rising to be a vice president in the platform group. To quote from his official BEA biography: "He was an integral part of the team responsible for developing and launching Microsoft's .NET strategy."

JAVA WATCH



STEVEN J. VAUGHAN-NICHOLS

When Nielsen left Microsoft two years ago, he formed Crossgain to create what we now call Web services. But—and this is where Microsoft got peeved—instead of using Windows 2000, SQL Server and Visual Studio for his foundation, he turned to Sun's hardware and Oracle's databases and development tools.

Bill Gates was not amused. To quote from a BusinessWeek story (www.businessweek.com/2001/01_06/b3718158.htm), "'It doesn't look very good for Microsoft if a company run by its former vice-president of developer relations is using software made by Oracle,' says a former Microsoft executive." I guess you could say that.

After failing to reach an agreement, Microsoft turned its attack lawyers on Crossgain. The lawyers were successful. In January 2001, Nielsen and 23 former Microsoft staffers—more than a quarter of Crossgain's staff—quit the company until such time that their noncompete agreements with Microsoft expired.

It was a gamble that didn't pay off. By the time Nielsen rejoined the company in the summer of 2001, it had shrunk from 80 down to about 28 core employees and was no longer viable. In July 2001, BEA bought Crossgain. As John Kiger, BEA's director of product marketing, put it, BEA was actually buying "a team of software developers that will help us deliver on our tools strategy."

And, indeed they did. The Crossgain-influenced WebLogic Workshop, according to some beta testers, appears to be an excellent IDE that makes extraordinarily good use of XML to deliver Web services. It might turn into the Java equivalent of a Visual Basic or Sybase's PowerBuilder in ease of use.

BEA needed a tool set like this. Unlike its application-server rivals, BEA hasn't had its own toolkit. Instead WebLogic application server developers have had to rely on tools from Borland and BEA spin-off WebGain.

The company has high hopes that, when the product goes golden late this summer, you and many other development team leaders will buy it.

BEA has received criticism for reported claims that applications built using WebLogic Workshop may only run on the WebLogic application server. Although it seems that the company was itself giving off mixed messages, BEA now denies that there's anything proprietary going on (http://www.sdtimes.com/news/047/story4.htm). I believe them.

WebLogic Workshop may prove to be a real winner. You see, I've found that many Java programmers do fine with applets and other small projects, but it's only the extraordinary ones that can graduate to major server-side projects. If you're like most managers, you probably have a lot more ordinary developers than you do wizard programmers. Wouldn't you want to try an IDE and framework that could get higher-level work from your rank-and-file programmers? I would. ▮

*Steven J. Vaughan-Nichols has been writing about technology for more than 15 years and also has worked as a programmer for NASA and the Dept. of Defense.*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# A THING OF BEAUTY

You're pleased as you inspect each screen. You click on every link and everything works. Everything is spelled correctly, the images load just as they're supposed to, and the forms actually send the right data to the database. Your team did a good job. This Web development effort resulted in a thing of beauty.

Except you don't know if it's *really* going to work. Yes, the in-house testing showed that, functionally, everything worked exactly as it should, but will it also work under load?

The problem is that you don't know. Even if you got everyone in the company to try to use the Web site at one time, it would be nowhere near the load you'll have when the gazillion or so users you expect start banging on your site. Of course, you can always just put the site up and hope for the best, but the downtime will kill you, and the embarrassment of having a flaky Web site won't go down well with the board or the CEO. So, more testing is the order of the day.

Fortunately, it's not all that hard to create the loads you need to confirm that your Web site will work as intended, thanks to some specialized hardware that can simulate about as many Web users as you'd ever want. Two of the companies that make such products are Ixia (www.ixiacom.com) in Calabasas, Calif.; and Caw Networks (www.caw.com) in Mountain View, Calif. Ixia's IxWeb is designed to mount in the company's line of test chassis, including the well-known Ixia 1600. Caw Networks provides the WebAvalanche, which is a stand-alone test set.

Both of these products are designed specifically to test Layer 7 functionality on the network, such as communications with Web server software. Once set up, either of these devices is capable of simulating vast numbers of Web sessions and huge amounts of traffic. When fellow columnist Oliver Rist and I tested these items, we found that the most significant limit to their testing ability was the capacity of the network to which they were attached.

WEB WATCH

WAYNE RASH

While proper configuration of these devices is critical to effective testing, neither is particularly difficult to use, and both companies offer training. However, you need more than just training in how to set these machines up and start the testing process. Both the Ixia IxWeb card and the Caw Networks WebAvalanche can produce a wealth of reports showing the details of how your Web site reacted to the traffic onslaught. When you study the reports, you can see which pages worked well, and which failed to hold up.

One of the things we found, incidentally, was that Web page design, and the coding that goes with it, is only part of the solution to making Web pages work well. We found that the hardware environment in which the Web server software is installed makes a surprisingly important difference. Likewise, controlling the load presented to a server (using load balancers, for example) makes a huge difference. Most of the time, when we observed the Web servers fail, they didn't just reach a point where they'd service a certain amount of traffic and refuse to handle more. Instead, when most of the Web servers failed, they experienced a dramatic drop in traffic, sometimes to a small percentage of the maximum they'd support.

All of this means that when you design for high performance, it pays to do more than just create attractive code that works. You also have to design the page so that you're not asking any one page to do too much, that you're not asking the server to perform beyond its limits, and that you're not trying to use network bandwidth that's not there.

In our testing we found, for example, that it's possible to design Web pages that can work reliably despite the fact that the server is being hit by tens of thousands of simultaneous sessions that have filled a Fast Ethernet network to its capacity. But if you're doing that, you can't expect the same Fast Ethernet segment to also provide access to your database. Likewise, to no one's surprise, too much complexity in the tasks you're asking the server and the Web server software to complete can result in poor performance.

The problem with our findings, of course, is that they apply only to our Web pages that we designed for testing dedicated servers. There's no question that your results will be different (if only because Oliver and I created some really awful pages for testing). What won't be different, however, is the fact that you can't tell whether your pages will work the way you think they will unless you test. And you need to test your page performance in an environment as close as possible to what you'll actually be using.

When you test, for example, use the same load balancers you'll be using in real life. Use the same server hardware. Use the same database server, and if you use an independent network for retrieving data in the real environment, use it in the tests as well.

While this kind of performance testing won't ensure perfect Web pages every time for every user, it will at least let you figure out if you've managed to avoid the worst performance bottlenecks and roadblocks. Then, when the gazillions of Web users descend on your site to see that thing of beauty your staff created, they'll actually be able to see it and appreciate it as much as you do. ▮

*Wayne Rash is a technology journalist and consultant.*

# WINDOWS CE .NET MAPS OUT 2002

Life: There's the good news, and then there's the bad news. And in Microsoft's case that pretty much always surrounds—what else?—its ability to live up to product expectation promises.

Let's start with the bad news: Windows .NET Server won't escape its beta shackles any time soon. You can now expect it to somewhere in the second half of 2002—probably the distant end. While that is bad news, there's at least a little good news in the reason why. Redmond says it's because of "enhanced security" concerns. Seems that someone at Redmond finally recognized a liability issue when he saw it, and Microsoft has been doing fairly extensive security auditing of its new operating system.

But though the company may have thought that the new security paradigm in .NET was going to pass such auditing with flying colors, the real world is a cold, gray and insecure place. No surprise: Windows .NET Server has security problems. But at least Redmond didn't release the code in its present state and then simply issue an "Oops, but it's not our fault" press release after some production servers got clobbered. The company is making a concerted effort to release a fully secure system and has delayed its release until that has been accomplished. Okay, I'll believe in a totally secure Windows system when I see it, but I'm certainly feeling much friendlier toward it now that I know Microsoft is at least trying.

The good news, on the other hand, relates to my last column concerning useless executive toys. Along with Pocket PC extensions for Visual Studio .NET, Microsoft has managed to deliver—on time—the Windows CE .NET handheld operating system, and it even has laid out some specific directions the platform will take in 2002 during the recent Intel Developer Forum.

WINDOWS WATCH

OLIVER RIST

The existing version of Windows CE .NET is fairly impressive by itself. Now that the operating system understands SOAP, for example, developers have significant new application avenues. The Windows CE .NET's bundled system image-building tool, Platform Builder, has been beefed up as well with wider device-centric configuration options and the ability to emulate specific devices in software.

Microsoft also has made it easier for CE developers to gain access to WCN source code by making visible the code for a number of core new features, including HTTP, MMQ, USB and Bluetooth. You can't change anything, but the increased depth is a helpful touch.

And for users, Windows CE .NET is simply a more feature-rich experience, especially in terms of wireless connectivity and multimedia support. Bluetooth has been mentioned, but there's an automatic configurator for 802.11*x* as well as support for OBEX, a media-independent data exchange protocol. On the interface side, Microsoft has incorporated its Media Player 8.0 technology as well as Internet Explorer 5.5, which Microsoft is hoping will bring a new window to mobile Internet entertainment—something I wouldn't be surprised to see enhanced via Corona later this year as well.

And speaking of later this year, Microsoft has released some detailed specs on what we can expect from Windows CE .NET throughout 2002. According to Redmond spokesfolks, a second-half 2002 Service Pack will be released for the operating system containing a number of new features.

Foremost, look for a fully muscled version of the .NET Compact Framework. As it stands, WCN has pieces of this .NET Framework subset resident already, but a fully featured version is needed to allow the operating system to interact completely with Microsoft's Web services strategy as well as to fully exploit Visual Studio .NET as its development platform. That should allow developers to more easily develop Windows CE-based apps across disparate hardware platforms.

While that will be the most noteworthy architectural improvement to Windows CE .NET, more mundane platform improvements will include a short message service (SMS), support for IPv6, and a host of new file viewers to include support for all Microsoft Office applications as well as Adobe application files.

Frankly, considering Microsoft's security worries on Windows .NET Server, I was expecting similar worries about Windows CE .NET, but so far Redmond is broadcasting a blue skies forecast. Considering the hard push Redmond is making to bring Windows CE .NET, Web services and especially the .NET Framework together, however, I can't imagine that the issue hasn't been raised. My bet is we'll see security enhancements to Windows CE .NET before the first service pack is released. ▮

*Oliver Rist is a freelance technology journalist and vice president of technology at AIC Inc.*

# GOT RULES?

Java Specification Request 94 from Sun Microsystems Inc.'s Java Community Process calls for a standard API through which Java applications can connect with rules engines. The fact that the specification is expected to advance into the public review stage next month, according to ILOG Inc.'s Colleen McClintock, is clear evidence that business rules technology is finally going mainstream.

INDUSTRY WATCH

DAVID RUBINSTEIN

In many of today's applications, business rules are hardwired into applications, making changes to those rules a tedious, time-consuming IT problem. When these companies want to change, for instance, the purchase limit that is eligible for a pricing discount, it can take months for the development team to find the rule within the application, and analyze the impact of the change on other rules and on the application itself; and then it takes another month or so to make the change, test the application and get it running.

For large organizations, multiply this by a thousand times, and you get a sense of the scope of the problem of managing and maintaining business logic. This, she said, is what ILOG's JRules 4.0 is designed to solve.

"Organizations have hundreds of thousands of policies running in multiple applications in different versions," she said. "There needs to be a central location for managing this stuff. How can I find out which rules are deployed? You need to do impact analysis. What other policies will be affected by a change to a policy? Has the rule been tested and validated? Is it even still a valid rule?"

McClintock, business rules product manager, said the key to keeping rules flexible is to store them outside the applications, in a rules repository that is called by a rules engine invoked by an application. The rules are written in plain English, not a programming language, which gives business executives the ability to write, change and understand them, and makes it easier for IT to implement the changes.

However, turning over control of the rules to businessmen and analysts brings with it a set of organization implications that software development managers must face. Developers might feel they are losing a bit of their stewardship over the applications because the rules are being updated in the repository without their help. Business people who lack the confidence to make changes to the repository still want the IT people to be responsible for the application being up and running.

Within JRules 4.0, ILOG has added a new repository, the foundation of which is based on Object Management Group Inc.'s Meta Object Facility and XML Metadata Interchange, which allows for the data to be exchanged between the repository and a modeling tool so rules can be defined within the modeling tool. ILOG, McClintock said, is working on automating extensions for import/export capability that will allow rules to be represented in UML. JRules also utilizes a rule language that acts directly on Java code and also can directly access XML. These interfaces are connected by a low-level programming language, McClintock said, that ultimately will allow companies to exchange business rules with their partners programmatically. This is where JSR-94 comes into play.

The rules that a company uses to govern its business can be quite complex, especially at a large corporation. But in the past, the numbers crunchers whose job it is to calculate the various formulas on which business decisions are made were kept in a closet somewhere in a subbasement office. One of the results of the recent push for internal application integration has been to move the actuaries out into the open, to get them more involved with business process. "Business has always been complex," said Brett Adam, senior director of marketing strategy at Versata Inc. "People have solved these problems with a whole lot of code."

When a shoe seller needs applications to identify if shoes are yellow, or Italian-made, hard-coding is manageable. When orders-of-magnitude variables are added to these equations, however, separating out the logic from the applications makes it possible for the apps to be changed and updated as the multiple variations behind the rules change.

Versata last month announced it will create a connector between its Logic Server and ILOG's JRules; ILOG will create a connector between its JViews for Workflow product and Logic Server.

ILOG provides rules creation and management; Versata provides an infrastructure for transactions with automated business processes. ILOG asks for business objects to make decisions based on rules, while Versata helps developers describe business logic in Enterprise JavaBeans.

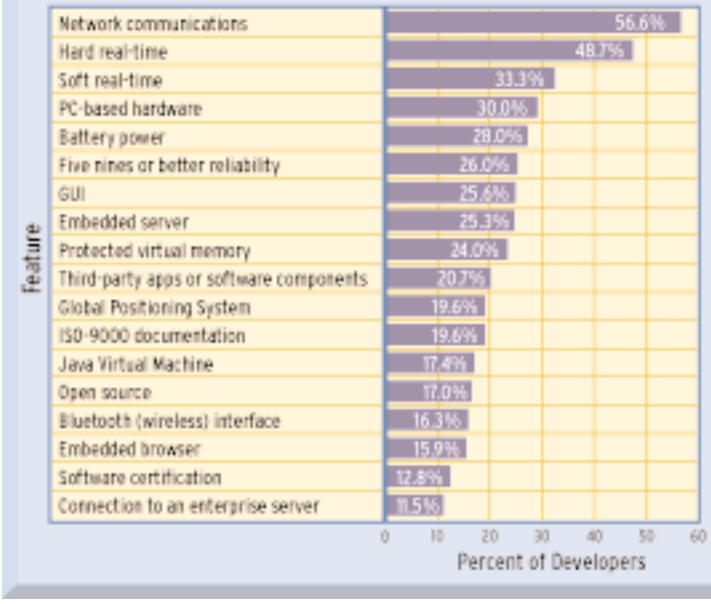
"Using Versata, say, in the insurance industry, you could define business transactions, but you couldn't put the rules themselves into a rule form…if a driver is over 35, a woman, with no history of accidents. These rules couldn't be expressed in Versata," McClintock said. "You had to do it in Java code."

Now, it can be done in plain English—easier than C++ or Java for business analysts and decision makers to understand. ■

*David Rubinstein is executive editor of SD Times.*

## Which New Features Are Developers Including in Embedded Applications?

EVANS DATA WATCH




Network communications and hard real-time functionality are the two most-cited new features being included in embedded applications, according to Evans Data Corp.'s most recent developer survey.

The multiple-choice questions showed that it's not just Internet appliances that are being fitted with network connectivity, but also a vast array of industrial equipment in the field, industrial controllers on the factory floor, automobiles and consumer appliances.

The high number of devices citing hard real-time followed by soft real-time capability would indicate a growth of activity in devices with electromechanical functionality of some sort, such as automotive systems or further growth in industrial, military and aerospace. PC-based hardware continues its strong advance due to its cost, size, availability of software and tools and its familiarity for developers for a vast number of applications. An equally strong advance for battery-powered devices is in line with the trend for more portable devices with connectivity.

*Source: Embedded Systems Developer Survey 2002, ©Evans Data Corp.*

www.evansdata.com

## BUSINESS BRIEFS

Embedded Linux provider **MontaVista Software Inc.** has received an undisclosed equity investment from **Panasonic Digital Concepts Center**, a subsidiary of **Matsushita Electric Industrial Co. Ltd.** Panasonic will take an equity stake in MontaVista, whose flagship product is the MontaVista Linux embedded operating system . . . **Systinet Corp.** announced it received $21 million in a new round of funding, led by venture capital firm **Warburg Pincus**. The money, according to the company, will go toward expanding its sales and marketing department and increasing R&D to enhance its WASP (Web Applications and Services Platform) product line . . . **Sun Microsystems Inc.** has filed yet another lawsuit against **Microsoft Corp.**, this one alleging that anti-competitive practices by Microsoft with respect to the Java platform have caused Sun financial harm. Among other things, the suit seeks to require Microsoft to disclose and license its proprietary APIs and formats to allow for competition. Sun seeks triple damages . . . **Be Inc.**, which sold its operating system assets to **Palm Inc.**, has voluntarily de-listed from the Nasdaq National Market. After filing one last lawsuit against Microsoft, Be also has filed a certificate of dissolution, and has ceased recording transfers of its stock . . . A San Diego-based vendor of a Linux-based operating system, which claims to be able to run some Windows software, has fought off a legal challenge from Microsoft and has won the right to brand itself **Lindows.com**. Microsoft sought an injunction preventing the company from using the name and the term LindowsOS. ■

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**Embedded Processor Forum** April 29–May 2
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MICRODESIGN RESOURCES
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